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Determinants of Tax Effort: A Cross Country Analysis

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DETERMINANTS OF TAX EFFORT: A CROSS COUNTRY ANALYSIS

by

Mark Alan McCoon

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
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ABSTRACT

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This paper analyzes the determinants of tax effort. Tax effort is defined as the aggregate tax level of a country divided by its Gross Domestic Product. A country's tax effort is an expression of the tax burden the government imposes on the economy. One of the most fundamental issues confronting a society is the size of the governmental sector. How large should the government be relative to the size of the economy? The nations of the world have crafted many different answers to that question as evidenced by the fact that tax effort and the size of government sectors varies widely. At the low tax extreme countries such as Guatemala can have tax efforts as low as ten percent of GDP while at the other extreme high tax countries such as Sweden have tax efforts in excess of fifty percent of GDP (World Bank 2010). While part of the variation in tax effort and the size of government among countries has been explained, much remains unexplained. The extent to which national cultural attributes as determined by Hofstede (2005) and the World Values Survey (2010) affect total tax levels is explored in this paper. In other words, this paper answers the question: does culture affect total tax effort and the size of the governmental sector? This research contributes to the literature by explaining more of the difference in tax effort among nations and by expanding our understanding of why some countries are high tax states and others are low tax states.

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CHAPTER I

INTRODUCTION

This paper analyzes the determinants of tax effort. Tax effort is defined as the aggregate tax level of a country divided by its Gross Domestic Product. A country's tax effort is an expression of the tax burden the government imposes on the economy. The extent to which national cultural attributes as determined by Hofstede (2001) and the World Values Survey (2010) affect total tax levels is explored. The research question this paper addresses is: does culture affect total tax effort and the size of the governmental sector?

One of the most fundamental issues confronting a society is the size of the governmental sector. How large should the government be relative to the size of the economy? The nations of the world have crafted many different answers to that question as evidenced by the fact that the size of government sectors varies widely. Likewise, the size of the governmental sector can vary during different time periods even within the same society, although generally the size of a country's governmental sector appears relatively fixed as a percentage of Gross Domestic Product. Indeed patterns in relative government size in Europe and the Americas observed by Tocqueville (2003) nearly two centuries ago are still apparent today.

Tax effort and the size of government are important, they matter. It has been recognized at least since Adam Smith (2009) that excessive taxation can be detrimental to the economy. Smith (2009) observed that taxation which is too high is self defeating. Optimal tax theory advocates a tax system which imposes as small a tax burden as

possible which meets the legitimate needs of government and maximizes the social welfare of society (Slemrod 1990).

Endogenous Growth Theory holds that fiscal and tax policy affects long run economic growth (Rebelo 1991). According to Barro (1990) increases in taxation and government spending have two effects on growth. The increase in taxation reduces growth because of the disincentive effects of taxation while the increase in government spending raises the marginal productivity of capital and increases growth (Barro 1990). Gains from government spending tend to outweigh losses from taxation when government is small, according to Barro (1990), while the opposite is true when government is large. Guider (2007) concurs, finding that government size beyond its optimal economic enhancing point, is growth inhibiting. Scully (1994) finds that government spending beyond twenty percent of gross domestic product to be counterproductive from an economic perspective. Tax effort which is too low leads to weak and unstable governments which are too weak to enforce their own laws. At the extreme, anarchy can result in such situations with weak underfunded governments. This was a concern of political philosopher Thomas Hobbes (2009). Hobbes, the originator of social contract theory, advocates strong governmental authority to safeguard against disharmony. Man's natural state, according to Hobbes (2009, xviii) is conflict; a "war of all against all," which only a strong government can prevent. In a similar vein North (1991) contends that the rule of law is fundamental to laying the foundation for economic development.

All governments need sufficient revenue in order to function properly. Governments of developing nations need additional revenue in order to build much

needed infrastructure while the governments of many developed countries need additional revenue in order to meet ever mounting social welfare obligations. The governments of Latin American countries, for example are almost without exception chronically and materially underfunded. Indeed, Bird, Martinez-Vazquez, and Togler (2008) contend the situation has persisted for half a century at least. Significantly less tax revenue is collected by countries in the region compared to the rest of the world (DataGov 2010). This leads to a vicious circle in that an underfunded government is a weak government and a weak government has less ability to enforce its own laws including the collection of tax revenues. Less tax revenue in turn leads to greater weakness.

There exists a wide variation in total tax levels among countries. At the low tax extreme countries such as Guatemala can have tax efforts as low as ten percent of GDP while at the other extreme high tax countries such as Sweden have tax efforts in excess of fifty percent of GDP (World Bank 2010). Even among OECD nations, substantial variation exists, as tax effort among some countries such as Denmark is twice that of others, such as South Korea (OECD 2009). This paper explains the basis for such dramatic variation. Clearly income is part of the explanation with higher income countries generally having higher tax efforts than lower income countries. In this respect tax effort, and by implication the government sector, acts as a luxury good in that when income increases the size of the government sector increases, in absolute and in relative terms. The demand for luxury goods increase by a greater percentage than income increases.

The main motivation of this study is to consider the affects of national culture on tax effort. While part of the variation in tax effort and the size of government among countries has been explained, much remains unexplained. This research contributes to the literature by explaining more of that difference and by expanding our understanding of why some countries are high tax states and others are low tax states.

The objective of this paper is to test hypotheses that certain aspects of national culture affect tax effort and the size of government. More specifically the objective of this paper is to test the hypothesis that countries with high individualism and collectivism have high tax effort and government spending and also to test the hypothesis that countries with low masculinity and femininity have high tax effort and government spending. Additional objectives are to test the hypothesis that low power distance is associated with high tax effort and government spending and also to test the hypothesis that high uncertainty avoidance is associated with high tax effort and high government spending.

Individualism and collectivism relate to the power of the group within society. In collectivist societies the loyalty is to the family, clan, or tribe and not to the nation, or society at large. The opposite is true in individualist societies where loyalty is to society. Masculinity and femininity relates to traditional gender roles. Masculine societies have more clearly defined gender roles with men being strong, assertive, and driven by achievement and material success while women are modest, caring, and concerned with quality of life. Power distance relates to the manner in which societies deal with human inequality. Societies with higher power distance scores have greater distance between classes while those with lower power distance are more egalitarian. Uncertainty

avoidance relates to the manner in which a society copes with the uncertainties of life. Societies with high levels of uncertainty avoidance have many rules and regulations, both formal and informal for dealing with an unpredictable and uncertain future (Hofstede 2001).

A further objective is to test the cultural dimensions observed by Inglehart and Welzel (2005) from World Values Survey (2010) data, specifically to test the hypothesis that countries with high scores on the traditional versus secular rational cultural dimension have high tax effort and government spending and also to test the hypothesis that countries with high levels on the survivalist versus self expression cultural dimension have high tax effort and government spending. Testing the World Values Survey cultural dimensions will be done in order to confirm the findings observed from the Hofstede cultural variable tests.

The traditional versus secular rational dimension reflects the importance of traditional beliefs to society. Strongly traditional societies are deferential to authority, view religion as very important in their lives, have strong family ties with well defined roles, are nationalistic, and have limited tolerance for others. Societies which have high secular rational values are less deferential to authority, view religion as less important, are less nationalistic, and have greater tolerance for others. The survivalist versus self expression cultural dimension reflects the transition from industrial society to post-industrial or knowledge society. In industrial societies, the emphasis is on economic and physical security while in knowledge societies, the emphasis shifts to individual well being, self expression, and the quality of life. Countries with high self expression values place a strong emphasis on participation in political and economic decision making,

gender equality, and individual freedoms and are generally tolerant of other cultures (Inglehart & Welzel 2005).

Stated formally, the alternative or research hypotheses are as follows:

H_1: There is a direct relationship between Individualism and collectivism and tax effort.

H_2: There is a direct relationship between Masculinity and femininity and tax effort.

H_3: There is a direct relationship between Power Distance and tax effort.

H_4: There is a direct relationship between Uncertainty Avoidance and tax effort.

H_5: There is a direct relationship between Traditional versus Secular Rational values and tax effort.

H_6: There is a direct relationship between Survivalist versus Self Expression values and tax effort.

Tsakumis, Curatola, and Porcano (2007) are the first to utilize Hofstede's cultural framework in an analysis of tax policy differences among nations. The authors find that the variation in tax evasion among countries is indeed related to Hofstede's cultural framework. In other words, culture matters at the national level at least with respect to tax evasion. Richardson (2008) in an expanded study also finds that culture matters at the national level with respect to tax evasion.

Pooled least squares regression is utilized to empirically test the main hypotheses of the study. Pooled least squares regression is appropriate whenever independently sampled cross sections are obtained from large populations at different points in time (Wooldridge 2006). Since the World Values Survey (2010) is conducted in such a

manner, pooled least squares is appropriate. Likewise, for comparative purposes, the Hofstede (2001) cultural dimensions are analyzed utilizing the same methodology.

This paper proceeds as follows; following the Introduction, Chapter Two consists of a review of the related literature. Included in Chapter Two is the theoretical foundation for the study. Chapter Three details the data, variables, and hypotheses utilized, while the following chapter, Chapter Four, reports the statistical methods used and results of the analysis. Finally, Section Five is a brief Conclusion. Included in the conclusion is a discussion of the limitations of the study as well as suggestions for further research.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

This chapter proceeds as follows: the first section is a discussion of tax effort and the closely related size of government. Included in this section are a number of studies related to known or hypothesized determinants of tax effort. Relying mostly on the work of Geertz (1973) and Hofstede (2001), the following section defines culture as it is used in this paper. Hofstede's (2001) cultural dimensions are the subject of the next section, followed by a section describing modernization theory. Modernization theory provides a theoretical foundation for the use of national cultural variables. The relationship between culture and economics is covered in the next section which is followed by a section discussing the relationship between culture and taxation. A brief discussion of optimal taxation is the subject of the next section. The chapter concludes with a brief summary of the theoretical foundation for the paper.

Tax Effort and the Size of Government

Fairly extensive literature exists regarding the size of government. Alesina and Spolaore (1997) contend that country size is the primary determinate of the size of government. Smaller countries in terms of population have larger governments in relative terms when measured as a percentage of GDP. This finding confirms the assumption that there are fixed costs associated with government.

A country's state of development has long been recognized as having a significant effect on the size of the governmental sector. More developed countries and countries with higher per capita income have larger tax efforts (total tax collected divided by GDP) and have larger governments in relative as well as in absolute terms. Further, as a

country develops and its per capita income increases, the relative size of its government increases as well. This phenomenon is referred to as Wagner's Law after the German economist Adolph Wagner, who developed the theory in the 1880's (Tullock 1993). Wagner's Law has been largely confirmed by the historical development of Europe (Meltzer & Richard 1981) and the United States (North & Wallis 1982), although Tullock (1993) cautions that there have been significant periods of time when economic development occurred which lack the predicted increase in government.

Trade openness is also thought by many to have an effect on the size of government (Cameron 1978). Although Alesina and Waciarg (1998) note the interconnectedness of trade openness and government size, they are reluctant to proclaim cause and effect. Rodrik (1998) has no such reluctance; he argues that trade openness results in larger government. According to Rodrik countries which are open to international trade are subject to external shocks, and accordingly, need larger governmental sectors to compensate. Rodrik finds a correlation between trade openness and the size of government which is not sensitive to changes in the measure of government size and applies to both high and low income countries (Rodrik 1998). In a contrary viewpoint, Benarroch and Panday (2008) utilize panel data and find no relationship between trade openness and government size and Ferris (2003) cautions about the use of alternative measures of the size of government.

Cameron (1978) shows that the level of trade openness in 1960 of OECD countries is an excellent predictor (R^2= .78) of subsequent increases in government tax revenue. Kimakova (2009) contends that financial openness is also associated with government size. Greater exposure to international capital flows, results in larger

governments. In the face of economic globalization, Bhagwati (2007) advocates that governments should become larger in order to compensate the losers from trade reform, keeping in mind that while trade may be beneficial to the country as a whole, some sectors, firms, and individuals exposed to foreign competition may be harmed. Winners from trade are the consumers who are able to purchase cheaper imported goods and the producers that make goods for export. Losers from trade are those producers who are faced with competition from foreign producers as well as consumers in the exporting countries who must pay more for the good. Garrett contends the effects of globalization on government spending are more pronounced for developing countries (Garrett 2001).

Expansion of voting rights is also thought by many theorists to result in increased taxation and government spending. Meltzer and Richard (1981) argue that expansions of the voting franchise invariably add lower income voters who tend to favor income redistribution policies. The researchers are reiterating an observation made by Tocqueville nearly two centuries ago (Tocqueville 1965). In partial confirmation, Husted and Kenny (1997) find that the elimination of poll taxes and literacy tests in several U.S. states by the mid 1960's resulted in an increase in demand for welfare and other transfer payments but did not result in an increase in demand for governmental services. A similar finding is evident in ten Western European countries from 1860 to 1938 (Aidtyand & Jensenz 2009).

Many other explanations for the size of government have been offered with varying degrees of empirical support. Voter demographics may play a role for example. Becker (1983) and Becker and Mulligan (2003) argue that as a population ages, political pressure grows to increase social security benefits and to transfer the tax burden from

taxes on capital to taxes on labor. Becker and Mulligan (2003) point to the work of Mulligan and Sala-i-Martin (1999) who find that U.S. government spending on the elderly increased from 1.1% to 8.8% of GDP in the second half of the 20th century while non-elderly government spending stayed relatively constant at around 25% of GDP. This is a manifestation of Schumpeter's "lobby of the old" (Schumpeter 1991, 377). Others however, have reached contrary conclusions about the elderly political clout in the United States and Western Europe with respect to government spending and taxation (Razin, Sadka, & Swagel 2002).

The number of legislators a government has may influence tax levels and overall government spending. Weingast, Shepsle, and Johnson (1981) formulate a model of government spending and observe a positive relationship between 'seats and spending' in unicameral legislatures. Chen and Malhotra (2007) extend the Weingast model to bicameral legislatures and analyze data from the United States Senate. Various constitutional provisions also affect the size of government according to Persson and Taballini (2004) although their conclusion has been challenged (Acemoglu 2005).

Democracy seems to lead to a larger government and higher taxation (Alesina, Spolaore, & Wacziarg 2000). Further, the form of democracy appears to matter as well with parliamentary systems resulting in higher taxes and more government spending than presidential type systems (Persson & Tabellini 2004). Political competition, defined as the absence of monopoly or near monopoly power by one political party, seems to lower tax levels (Besley, Persson, & Sturm 2005) while political instability seems to increase spending (Annett 2001), an observation once noted by Aristotle (Mahon 2004). At the opposite extreme from high tax states are low tax states which are more commonly

referred to as states suffering from low tax effort. Low tax effort is a hallmark of many countries, especially those in Latin America, suggesting that culture may play a role.

All governments need sufficient revenue in order to properly function. Governments of developing nations need additional revenue in order to build needed infrastructure. Some countries and regions do better collecting sufficient tax revenue than others. Among others, the governments of Latin America, for example are almost without exception chronically and materially underfunded (Bird, Martinez-Vazquez, & Togler 2008). This leads to a vicious circle in that an underfunded government is a weak government, and a weak government has less ability to enforce its own laws including the collection of tax revenues. Less tax revenue in turn leads to greater weakness.

Countries with high levels of income inequality also tend to be weak states which oscillate between dictatorship and fragile democracy according to Acemoglu and Robinson (2001). The authors cite Argentina as an example which shifted seven times from dictatorship to democracy or vice-versa in the twentieth century. Argentina's income inequality, as measured by its Gini coefficient is 51 according to the World Bank (2011). By way of comparison high income countries have an average Gini coefficient of 35, South Asian countries 37 and Middle Eastern Countries 39. Acemoglu and Robinson (2001) speculate that low tax effort may result in such countries as a safeguard against coup d'état.

Bird, Martinez-Vazquez, and Togler (2008) theorize that low tax effort countries lack a social contract between the state and its citizens. Such a social contract is the foundation of a properly functioning tax system. The authors also speculate that political will is necessary for tax reform, a view shared by Stein (2005). Bowler and Donovan

(1995) provide empirical evidence of voters linking dissatisfaction with government to dissatisfaction with taxation. Accordingly, better government may result in better tax collection and higher tax effort.

Moore (2004) contends that the source of governmental revenue has a dramatic effect on state behavior. In other words, the quality of governance is better when the state depends upon its citizens for revenue. Moore (2004) points to historical examples as well as the modern day examples of Poland and Russia. Upon the fall of communism, Poland instituted a broadly based tax system and is more responsive to its citizens while Russia has relied upon the taxation of natural resources for its revenue and is less responsive. Responsive government, according to Bird, Martinez-Vazques, and Togler (2008, 58) is, "an essential precondition for a more adequate level of tax effort."

A country's inability to collect sufficient tax revenue results in significant budget deficits which add to the national debt. Greater amounts of debt in turn lead to greater interest obligations which further strain government finances (Offerdal 2004). Additionally, in an attempt to increase revenue collections, low tax effort governments have imposed some of the most economically distorting types of taxes. According to Hubbard (2002, 21) "governments are tempted to turn to schemes that secure revenue despite their inefficiency and broad cost to the economy." Latin American governments for example have imposed such distortive taxes as taxes on corporate assets, equity, minimum income, and bank transaction taxes (Muniz 2006). Although all taxes create deadweight losses, these taxes are thought to be associated with especially large losses of welfare over and above the amount of the tax collected. A minimum income tax is a tax on deemed income which is typically calculated assuming a fixed return on revenues,

equity, or assets. A bank transaction tax is a tax on a specific type of financial transaction such as a bank deposit, transfer, or check. Although they have been reduced by considerable margins throughout much of the world; trade inhibiting tariffs and export duties have remained high in the region. Indeed, international trade taxes in Latin America as a percentage of total tax revenue are nearly six times as high as they are in Eastern and Central Europe and over 40 times higher than in the industrialized nations of the world (Inter-American Development Bank 2010). Distortive taxes, as well as high taxation of international trade, inhibit economic activity, and accordingly, reduce growth.

Both Acemoglu (2005) and Sindzingre (2007) believe that the very essence of a state is defined by its ability to tax. Weak states according to Sindzingre (2007) are those that lack the power, will, or credibility to stand up to political challenges and impose taxation on their own citizens. Bergman (2002) contends that historically, monarchs and governments have risen and fallen based on their ability to collect sufficient revenues from their subjects.

Definition of Culture

Any study which utilizes culture as an explanatory variable must take great care in defining precisely what 'culture' means. Culture is, after all, a term which has been defined by scholars literally hundreds of times (Kuper 1999). It has become, according to Kuper an overused catch all phrase with multiple meanings subject to manipulation by scholars. Indeed, Kuper (1999) documents some 157 definitions of culture used by American anthropologists between 1920 and 1950 alone. Still, a consensus on culture's definition has emerged (Kuper 1999). According to the consensus view culture is learned not innate; not a matter of race or ethnicity and involves ideas and values. Further the

consensus holds that aspects of culture are common to all mankind and that mankind's common culture has advanced over very long periods of time (Kuper 1999).

Geertz (1977) favors what he terms the classical definition of culture. Culture, to Geertz consists of the knowledge, beliefs, law, morals, and customs of a people. Concurring with Geertz' definition of culture is Kuper (1999) who adds only the importance of tradition to the definition. Culture can also be thought of as a defense against human nature since culture acts as a constraint against inappropriate action according to Geertz (1977).

Hofstede and Hofstede (2005) consider culture to be a broadly defined collective phenomenon. They state that "culture consists of the unwritten rules of the social game. It is the collective programming of the mind that distinguishes the members of one group or category of people from others" (Hofstede & Hofstede 2005, 4). Culture, to the Hofstede's is acquired over a person's lifetime with much of it learned during childhood. Culture rests between human nature and individual personality.

Hofstede and Hofstede (2005) also contend that multiple levels of culture exist. Those levels consist of a national level; a regional and/or ethnic and/or religious and/or linguistic level; a gender level; a generational level; a social class level and for those employed an organizational, departmental and/or corporate level.

Hofstede's survey finds no evidence of cultural convergence and little support for Huntington's multiple civilization hypotheses (Hofstede & Hofstede 2005). Huntington (1993 and 1996) argues that civilizations are cultures writ large and as such are the primary factor in international affairs. Hofstede's multinational surveys do not however support Huntington's conclusion rather they find significant attitudinal differences among

nations within the same civilization (Hofstede & Hofstede 2005). Indeed, Hofstede's culture dimensions show little apparent civilization based pattern. For example, in the masculinity and femininity cultural dimension a European Union country, Slovakia scores highest while another European Union country, Sweden finishes lowest. Likewise in the power distance cultural dimension a Central American nation, Panama scores second highest while its next door neighbor, Costa Rica has nearly the lowest observed score. Only in individualism and power distance are some of Huntington's civilization patterns apparent. Western nations generally score high on individualism and low on masculinity relative to the rest of the world, although even there exceptions exist (Hofstede & Hofstede 2005). Conversely, Inglehart's mapping of cultural values from the World Values Survey seems to confirm Huntington's eight or nine civilizations, at least to a limited extent (Inglehart & Welzel 2005).

Disputing Huntington's civilization theory is Wei-Ming (2000) who argues that American culture differs sufficiently from European culture and that merging them into one Western culture is erroneous. Further, Wei-Ming contends that even within Europe the cultures and historical experiences of Britain, France, and Germany are so significantly different that generalization is impossible. Hofstede (2001) concurs, finding vast cultural differences even among geographic neighbors in Europe. Even Britain itself is by no means a monolithic culture (Sowell 1996). Likewise Reid (2007) finds vast cultural differences among Latin American countries. Panama, Costa Rica, and Nicaragua, for example differ significantly culturally.

Harrison and Huntington (2000) concur with Hofstede (2001) that cultures typically change only very slowly over time. They point out however, that sometimes

dramatic changes in culture can occur; citing post World War II Japan and Germany as examples of cultures which experienced rapid change. Schumpeter (1991) also concurs, finding a historic aversion to change among peoples and concluding that aversion to change must be part of human nature. The fact that national culture is generally fixed over relatively long periods of time justifies the use of measures of national culture collected over extended periods of time.

Campbell (2004) maintains that cultures and institutions typically change very slowly over time in most circumstances, even when faced with significant external pressures. Campbell, in a study of tax systems throughout the world finds globalization has little effect on tax culture or institutions. Huntington (1993 and 1996) concurs, arguing that civilizations and cultures are not converging toward a common or universal culture.

Inglehart and Baker (2000) view culture as being path dependent, a view shared by Campbell (2004). The authors also argue that causality between culture and economics is difficult to ascertain. Inglehart and Baker (2000) like Weber (2003) view cultural change as being necessary for economic development. In other words, the developing world must adopt modern cultural values in order to economically develop. Traditional cultural values, according to Inglehart and Welzel (2005), act as a deterrent to economic development.

Fukuyama (2002) sees such things as: truth telling, meeting obligations, and reciprocity as being productive or useful cultural values. These values incidentally correspond closely to Weber's Protestant Work Ethic (Weber 2003). The Protestant Reformation was of critical importance, according to Weber because it extended honesty

and reciprocity beyond the family to society at large. That expansion was necessary for the subsequent development of both capitalism and democracy (Weber 2003). Paradoxically strong family ties are detrimental to modern society according to Fukuyama (2000). Fukuyama cites China and Latin America as examples where strong family ties interfering with societal interactions. Likewise Putnam (1993) cites southern Italy as a region negatively impacted by strong family ties.

Hofstede's Cultural Dimensions

This paper relies on Hofstede's (2001) cultural dimensions. Hofstede contends that national cultures exist and that those differences are significant enough to matter to many things, including tax policy (Hofstede 2001). Hofstede and Hofstede (2005) define culture as 'collective mental programming' which is shared by all members of a nation, region, or group. According to Hofstede (2004), culture at its deepest level, is unconscious and not open to discussion. It is also relatively fixed over long periods of time. Hofstede (2001) identified four cultural dimensions from data collected from IBM employees spread throughout the world. The four cultural dimensions are: power distance; uncertainty avoidance; individualism and collectivism, and masculinity and femininity. A fifth cultural dimension, long term versus short term was subsequently identified from further surveying.

Four of Hofstede's five cultural dimensions appear to be directly applicable to a country's level of tax effort. Individualism and collectivism is the first such dimension. At the extreme, countries with high scores on individualism are more loosely organized with a large amount of individual freedom, while high collectivism societies are more cloistered with the family, the clan, or the local tribe being the dominant cultural feature.

Collectivism has been identified as being associated with undesirable social and economic outcomes. Individualistic societies tend to be more open and allow for greater social mobility. Individualistic societies are more concerned with the individual while collectivist societies are concerned with the group. Loyalty to society, associated with high individualist societies, should be associated with a willingness to pay higher taxes for the benefit of society.

The second Hofstede cultural dimension hypothesized to be related to a country's level of tax effort is what Hofstede calls masculinity and femininity. In high masculine societies typical masculine values predominate. Such things as showing off, valuing outward appearances, and performing are stressed. In more feminine societies traditional feminine values are more important. Relationship building, cooperation, modesty, and the quality of life are important in such societies. Feminine societies tend to be more modern while masculine societies tend to be more traditional. Sweden and the Netherlands are examples of feminine societies while Spain and Argentina are examples of masculine societies. The greater concern for other members of society observed in more feminine societies should translate into a greater willingness to submit to taxation, and accordingly, such societies should have higher tax efforts.

The third Hofstede cultural dimension hypothesized to be related to tax effort is power distance. Power distance relates to the manner in which societies deal with human inequality. Inequality among individuals is explicit in the superior subordinate relationship. Inequality also can be related to physical or mental characteristics, social standing, prestige, income, wealth, power, age, or occupation (Hofstede 2001). Societies in which power distance is great are termed elitist while those with little distance between

social levels are considered pluralist. Power distance scores of countries are consistent over time as trend data, according to Hofstede (2001), indicates no evidence of significant movement. In societies with high power distance, there is a large gap in social standing between those with prestige and those without, while in countries with low power distance scores, the gap is minimal. Countries with high power distance scores include Malaysia, as well as most Arab and many Latin American countries. Countries with low power distance include many European states as well as Costa Rica. Pluralist or low power distance societies should be associated with a greater willingness to submit to taxation and, accordingly, higher tax effort.

The fourth and final Hofstede cultural dimension hypothesized to be related to tax effort is uncertainty avoidance. Uncertainty avoidance is a cultural coping mechanism which compensates for the anxiety associated with an unpredictable and uncertain future (Hofstede 2001). Societies throughout the world have developed diverse strategies for dealing with uncertainty. The name as well as the theoretical basis is from Cyert and March (1963). Uncertainty avoidance is manifested through technology, laws, and religious practices (Hofstede 2001). Coping with the inevitable uncertainty of life is a non-rational process with deep historical roots according to Hofstede (2001). Strong uncertainty avoidance is associated with rigid rules and regulations. Rules and regulations can be either formal or informal. Countries with high levels of uncertainty avoidance include Greece, Portugal, and Guatemala. Countries with low levels of uncertainty avoidance include Singapore, Jamaica, and Denmark (Hofstede 2001). A higher level of uncertainty avoidance should be associated with a greater demand for government and, accordingly such societies should be associated with higher tax efforts.

Hofstede's cultural dimensions have been used to explain national differences in a wide range of social, political, and economic phenomena. The cultural dimensions have also been used to explain differences in such diverse things as union membership rates (Singh 2001), antibiotic use (Deschepper 2008), and the use of video-conferencing (Dustdar 1999). This paper extends usage of Hofstede's cultural dimensions to tax effort and the size of government.

Franke, Hofstede, and Bond (2001) find that variation in national cultural attributes explains a large share of differences in economic growth among countries. The authors analyze a sample of 18 countries over two time periods and find that both certain cultural values and beliefs are conducive toward growth.

Ding, Jean, and Stolowy (2005) utilize Hofstede's cultural variables to show that cultural factors contribute toward the differences in national accounting practices. In a sample of 52 countries with individually articulated national accounting principles the authors find that culture matters more to accounting policy divergence than does legal origin. Likewise Lewis (2001) utilizes information from the Securities and Exchange Commission and finds a statistically significant relationship between Hofstede's individualism cultural dimension and national income measurement practices. The finding confirms Gray's (1988) theory that national culture affects national accounting principles and practices.

Hope *et al* (2008) find that cultural factors, as measured by Hofstede, have an effect on firms' choice of auditor. Using a very large sample of firms from 37 countries, the authors find that firms from countries with high levels of power distance and uncertainty avoidance and low levels of individualism are less likely to hire a big 4

auditor after controlling for various firm attributes. In a similar study, Tsakumis (2007) finds that national culture as measured by Hofstede is a determinant of differences in willingness to disclose adverse information in accounting statement footnotes. Likewise, Chan, Lin, and Mo (2003) find a correlation between Hofstede's cultural dimensions and the magnitude of accounting errors discovered during financial statement audits. Tsui and Windsor (2001) find that Hofstede's cultural dimensions are associated with differences in ethical reasoning among auditors in Australia and China.

Husted (1999) finds that Hofstede's cultural dimensions impact corruption levels after controlling for national wealth, income distribution, and government size. Specifically high scores on power distance, masculinity, and uncertainty avoidance are all significantly correlated with high levels of corruption.

Modernization Theory

Providing a theoretical foundation for the divergence of national cultures observed by Hofstede (2001) is Modernization Theory. The key tenant of Modernization Theory is that socioeconomic progress brings with it, significant and fundamental cultural change (Inglehart & Welzel 2005). When a society develops and modernizes fundamental changes occur in its cultural values and beliefs. It is a contention which has strong empirical support. The empirical support is provided by World Values Survey (Inglehart 2010). The World Values Survey is a series of national level personal opinion surveys conducted in many countries throughout the world every five years or so. The initial survey was conducted in 1981 and covered 24 mostly European countries. The most recently completed survey started in 2005 and covered over 80 nations throughout the world. Those nations represent nearly 85 percent of the world's population. The

surveys are intended to provide information on the values and beliefs of the world's inhabitants. The surveys grew out of the European Values Survey and are conducted under the direction of Ronald Inglehart of the Institute of Social Research at the University of Michigan.

Inglehart and Welzel (2005) contend that values and beliefs are of crucial importance. Indeed, values and beliefs shape and define human behavior. The researchers also see fundamental changes occurring to the belief systems of people throughout the world. Those changes are primarily driven by socioeconomic development. Cultural changes are not random but neither are they linear, rather cultural change occurs in fits and starts. Based on the analysis of World Values Survey data, Inglehart and Welzel (2005, 15) conclude:

> -There is a wide diversity of cultural values throughout the world. Core beliefs and values differ greatly between nations and groups of nations. This is especially true of differences between the developed world and the developing world.
>
> -Cultural values change but they do so in a largely predictable pattern. Cultural change is mostly dependent upon socioeconomic development with changes in the composition of the labor force sector being the most important determinate.
>
> -Changing cultural values have important consequences at the societal level with respect to governance, equality, the rule of law, and democracy.
>
> -At any given point in time, a society's culture is shaped by the interaction of changes brought about by socioeconomic development and the society's historic cultural traditions.

-Cultures change, but they do so in a path dependent manner. A society's cultural traditions limit the range of cultural change.

-Cultural differences among nations are robust and endure over time. There is no evidence of worldwide cultural homogenization. Cultural differences among nations are as great in 2001 as they were in 1981.

The common theme of changing values and beliefs throughout all societies of the world is the striving for greater individual autonomy and personal choice (Inglehart & Welzel 2005). As socioeconomic development occurs, material, social, and cognitive constraints on human activity are lessened (Inglehart & Welzel 2005). Development literally expands the range of human thought, according to the authors. This view is supported by data from the World Values Survey.

The World Values Survey has been utilized by researchers in a number of fields. Data from the surveys has been used in a wide range of studies including such diverse areas as preferences for trade protection (Mayda & Rodrik 2005), the gender gap in math scores (Guizo *et al* 2008) and the incidence of violent crime (Lederman, Loayza, & Menendez 2002).

Guiso, Sapienza, and Zingales (2006) find that culture affects economic outcomes. Utilizing World Value Survey data, the authors first show culture has an effect on preferences for redistribution. The authors then provide evidence that preferences for redistribution have an effect on actual redistribution and taxation policies in a study of U.S. states. In an earlier study Guiso, Sapienza, and Zingales (2003) find an association between culture; again as measured by the World Values Survey and national savings and investment.

Tabellini (2010) finds culture as measured by the World Values Survey to be associated with GDP per capita as well as economic growth. Granato, Inglehart, and Leblang (1996) reach a similar conclusion also utilizing the World Values Survey data.

In a study of tax morale in Latin America Togler (2005) finds that aspects of national culture as measured by the World Values Survey are major factors in determining the willingness to comply with tax laws. A similar finding is reported by Alm and Togler (2005) in a study of tax morale in the United States and Europe.

Taking a somewhat contrary position, Harrison (2006) argues that politics, or more specifically political will, can change national cultures. He cites Singapore and Chile as examples where strong political leadership committed to change has had dramatic affects on the national culture and prosperity.

Conceptually, Inglehart and Welzel (2005) see a two-stage process that societies undergo in their transition from traditional to modern. In the first stage, the society's economy transitions from being based on agriculture to becoming more industrialized. At this stage of development rationalizations, secularizations, and bureaucratization of society occur. This process is accompanied by a lessening in the importance of traditional values and beliefs, including a lessening in the importance of God. Indeed, among the developing nations of the world, God is important on a daily basis by up to ninety five percent of the population in some countries but as little as three percent in some highly developed nations (Inglehart & Welzel 2005).

The historic development of modernization theory can be traced to 18th century French mathematician, philosopher, and economist Marquis de Condorcet and the Age of Enlightenment (Inglehart & Welzel 2005). De Condorcet was the first to write of the

idea of progress. The expansion of knowledge, de Condorcet contends, will act to expand material well being, political freedom, and virtue. Progress leads to the inevitable perfection of humankind, according to de Condorcet (Acton 2007). Notable theorists Adam Smith, Karl Marx, and Max Weber also contributed to Modernization Theory (Inglehart & Welzel 2005). While they offer decidedly differing interpretations of modernization, each sees technological innovation and socioeconomic development as having profound effects on humankind's cultural values. Among the first theories of economic development was the idea that the traditional values of poor societies needed to be changed in order for those societies to develop. In other words, cultural change will lead to economic growth and development. Rostow (1959) as well as Almond and Coleman (1960), and Pye and Verba (1969), all make such arguments. Inglehart and Welzel (2005), based on their analysis of World Values Survey data, find that it is economic development which causes cultural change.

Broadly defined, the two stages of transition from traditional to modern can be depicted as follows:

Stage 1: Industrialization results in a transition from traditional values to secular rational values.

Stage 2: Post-Industrial Modernization results in a transition from survivalist values to self expression values.

According to the world cultural map (Inglehart & Welzel 2005) Zimbabwe and Morocco are examples of traditional societies. They have yet to industrialize and accordingly are pre-stage one. As such they have strong traditional and survivalist values. Russia and Bulgaria are examples of countries which have completed stage one.

They are industrialized societies which score strong in secular rational values but weak in self expression values. Japan and Norway are examples of countries which have completed both stages. Their societies have strong secular rational values and strong self expressionist values.

In general all societies are currently in the process of cultural change, some on a massive scale, with the most developed nations of the world undergoing the greatest degree of change in values and beliefs (Inglehart & Welzel 2005). The percentage of the labor force employed in the industrial sector appears to have the strongest effect on a society's cultural values. A preindustrial society with most of its labor force employed in agriculture has strong traditional values. As a society industrializes and the size of the labor force devoted to industry grows, the values of society gradually shift to become more secular-rational and less traditional. This value shift does not increase individual autonomy but rather replaces the authority of God and of organized religion with the authority of technology, science, and the organized industrial sector. There is no loss of authority when cultural values shift from traditional to secular-rational; it is the nature of the authority which undergoes change (Inglehart & Welzel 2005).

It is the second stage of cultural transition where respect for authority diminishes. When societies transition from industrial to post-industrial cultural values begin to shift from survivalist to self-expression (Inglehart & Welzel 2005). Respect for authority diminishes and many key institutions of industrial society are eroded as individual autonomy increases. The second stage of cultural transition occurs once the economy evolves from its industrial base to become a service based economy. The percentage of the labor force employed in the industrial sector declines and employment in the service

sector increases. Inglehart and Welzel (2005) theorize that the knowledge based economy significantly increases the range of human interactions. This in turn has significant effects on cultural values and beliefs.

Self expression values, contrary to the implication of their name are not self or ego-centric, but rather are humanistic. Such values are people centered and are concerned with individual autonomy expanding personal freedom (Inglehart & Welzel 2005).

Although cultural values are changing throughout the world, they are doing so very gradually (Inglehart & Welzel 2005). Cultural values, to a great extent are determined early in life and largely reflect prevailing conditions in society. Contrary to prevailing views, survey data indicates that cultural values do not change much over a person's lifetime. Accordingly, societal cultural values and beliefs change only as one generation is replaced by the next (Inglehart & Welzel 2005). Accordingly, the World Values Survey lends some credibility to Hofstede's (2001) contention that cultural changes occur slowly and gradually and therefore cultural scores obtained from the IBM surveys maintain their original usefulness. Adding further credence is Inglehart and Welzel's (2005) observation that all or virtually all societies in the world are undergoing cultural change and further that those changes are all in the same direction. Cultural changes observed by Inglehart and Welzel (2005) are from traditional values to secular rational and from survivalist to self expressionist.

Inglehart and Welzel (2005) contend that there is a certain evolutionary logic associated with cultural change, a view shared by Porter (2000). Cultures change, only when there is a compelling reason for them to do so. Socioeconomic development is by

far the most compelling reason for a culture to change. It is not however the only reason cultures change as a significant portion of cultural change remains unexplained (Inglehart & Welzel 2005).

Conceptually the idea of progress is a relatively recent phenomenon. Sustained economic growth, where production growth exceeded population growth, created the revolutionary concept of human progress (North & Thomas 1973). Prior to that occurrence, survival and avoiding starvation were humankind's primary if not exclusive priorities. The simple fact that most people in the Western world, for the last five hundred years or so, wake up with the notion that they will not starve to death that day is unique in human history and further, has profound implications on cultural values and beliefs (Inglehart & Welzel 2005). According to Inglehart and Welzel (2005, 23), "throughout history, survival has been precarious and human choice has been restricted for most people," it is only with the advent of socioeconomic development that humankind has been liberated from such severe constraints. Socioeconomic development has lessened material, social, and cognitive constrains on humans, and it has greatly expanded the realm of possibilities (Inglehart & Welzel 2005).

Culture and Economics

That culture matters to economics is a controversial contention. Many economists, for a variety of reasons, do not like culture as an explanation for economic phenomenon. However, Hojman (1999) in an extensive review of the literature notes that there is now a substantial body of literature which posits the view that culture has a direct effect on economics, Gereffi (1989), Lobkowski (1991), Inglehart and Baker (2000), Montaner (2000), Fukuyama (2002), Bergman (2002 and 2003),You and Khagram

(2005), Guiso (2006), and Tabillini (2010) concur. Fukuyama (2002) contends that in the past cultural explanations have been abused, while Olson (1996) maintains that the concept of culture is too vague and accordingly does not lend itself toward fitting into production functions. Obviously a variable must be quantified in order to be measured or to fit into an econometric model, which undoubtedly contributes to culture's lack of widespread use among economists. However, Schumpeter reminds us that economists should not ignore a phenomenon simply because it is difficult to measure (Schumpeter 1991). An additional factor may be as Sowell (2008) maintains, there is reluctance on the part of researchers of pointing to culture as an explanation of the differences in performance between countries or between groups because they do not want to be accused of blaming the victim.

Still, culture appears to offer substantial explanation for many economic phenomena and it is growing in acceptance among economists (Guiso, Sapienza, & Zingales 2006). Guiso *et al.* (2006) notes that concepts of culture and economics were originally closely linked by, among others, Adam Smith and John Stuart Mill. However, they also caution that combining economics with cultural concepts brings with it the problem of causality.

Assuming culture does have an effect on economics, the question remains: what is the mechanism by which culture affects economics? In other words, how does culture either benefit or hinder economics? Theorists have a wide range of views on the subject. Fukuyama (2002) contends that culture is the predominant component of social capital and that social capital is important to economic development. Hojman (1999) is

convinced culture effects attitudes toward such things as work, innovation, savings, and profits. Landes (1999), not to mention Weber (2003), concur.

According to Huntington, culture must be at least partially responsible for the vast differences in development between the developing and developed worlds (Harrison & Huntington 2000). Harrison (1985) finds that aspects of Latin American's culture are detrimental to its growth and development. Latin American culture differs from North American culture according to Harrison (1985) in its time orientation, work ethic, frugality, education, merit, ethics and corruption, justice, and secularism.

Huntington (1996) contends Russia's Orthodox culture inhibits its economic growth. Likewise Islamic culture in the Middle East hinders its economic development according to Huntington (1996). Sachs (2000) disagrees, finding no evidence Muslim societies are at a disadvantage economically after controlling for economic policies and geography. Cameron and Neal (2003) concur, finding that historically Islam has been favorably disposed toward merchants and trade. Hourani (1991) agrees noting the expansion of international trade and the proliferation of merchants, craftsmen, and scholars which coincided with the creation of the Muslim empire.

There are many examples of minority cultural groups thriving within an otherwise poorly functioning economic system. Both Sowell (1996 and 2008) and Harrison and Huntington (2000) discuss multiple examples of economically successful minority groups such as the Chinese in South East Asia, the Japanese in Brazil, the Ibo's in Nigeria, the Indians in East Africa, the Lebanese in West Africa, and the Jews in many locations. Although the economically successful minority groups are geographically and otherwise diverse, Sowell (1996) finds that they have much in common regarding their views on

hard work, thrift, and sobriety. Weber (2003) offers at least a partial explanation for the phenomenon when he observes that minority groups are often excluded from the political process and driven into (lowly regarded) economic activity in order to survive.

Landes (1996) discusses a couple of paradox to the culture matters argument. The first paradox is that if culture matters then why have the Chinese been so successful abroad and so unsuccessful, until recently, at home? The second paradox is if culture matters then why have the Chinese been so unsuccessful for so long and lately so successful? Sachs (2000) reiterates by pointing to China's explosive growth since its economic opening in 1978 as evidence that it is policy and not culture that matters to economics. However, rather than indicate that culture does not matter to economics, it is much more likely that other factors, in addition to culture, matter as well. Porter (2000) concurs, maintaining that the proper macroeconomic policies are a necessary but not a sufficient condition for growth.

Also potentially weakening the culture matters to economics argument is the fact that many widely diverse cultures have achieved economic development. Japan, the Asian Tigers as well as, to a lesser extent Chile, Costa Rico, Barbados, and Botswana are all examples of non-Western economic success stories. However, Sowell (1996) notes many cultural similarities among economically successful nations, especially with respect to such things as work ethic, frugality, and education which transcend national cultures.

While Porter (2000) believes culture plays a role in economic progress, he acknowledges that culture is complex and that its effects are difficult to isolate from other factors, a view shared by Harrison (1985). Porter also contends that culture has an influence on competitiveness at the micro or firm level. However Porter (2000) stops

short of assigning blame for lack of development on developing countries poor work ethic, contending that a lack of proper incentives is the likely cause.

Although national culture may be slow to change, economic culture may be capable of much more rapid transformation. Porter (2000) cites Japan's high savings rates and system of lifetime employment as relatively recent examples. Indeed, both Japan's high savings rates and lifetime employment developed after its defeat in World War II. High savings and investment rates in China would be an even more recent example of rapid economic cultural change.

Globalization, Porter (2000) argues will not eradicate national cultures but rather will enforce a form of discipline on economic cultures. Porter's view was voiced earlier by American Sociologist Parsons (1967). Parsons (1967) felt that certain aspects of Western culture such as industrialization and urbanization would spread across the globe as other societies developed. Likewise Stiglitz (1998) contends that development transforms societies. That transformation however is not orderly and linear; rather it is messy and sloppy. Capitalism, Stiglitz (1998) reminds us took centuries to develop in the West and entailed a societal transformation from the traditional to the modern. The long, uneven, and arduous development of capitalism has been well documented by North and Thomas (1973), Schumpeter (1991), and Weber (2003).

Fukuyama (2002) argues for the importance of social capital, which he defines as the shared values and norms of a society which allow for cooperation. Social Capital is of critical importance to economic development, democracy, and civil society according to Fukuyama. Values and norms can be either positive or negative, with the La Cosa Nostra or Mafia in Southern Italy being an extreme example of negative values and

norms according to Fukuyama. Putnam (1993) concurs, finding that negative values and institutions explain much of southern Italy's social and economic backwardness compared to the northern Italy. Putnam's (1993) work built upon that of Banfield (1958) who found what he termed 'amoral familism' hindering development in a small town in southern Italy. Fukuyama (2000) also considers China and Latin America to be examples where strong family ties interfere with societal interactions. According to Fukuyama (2000) positive or productive values include such things as: telling the truth, meeting obligations, and reciprocity. The Protestant Reformation was important economically according to Weber (2003) because it extended honesty, reciprocity, and thrift beyond the immediate family to society at large.

Culture and Taxation

Nerre (2008) contends that a properly functioning tax system must take into account a nation's tax culture. Tax culture, according to Nerre, is where the economics, sociology, and history of a country meet. Strumpel (1969) sees tax culture as a component of a nation's political culture. Tax culture is embedded within the larger national culture. Nerre (2008, 155) defines tax culture as:

> A country-specific tax culture is the entirety of all relevant formal and informal institutions connected with the national tax system and its practical execution, which are historically embedded within the country's culture, including the dependencies and ties caused by their ongoing interaction.

Tax culture to Nerre (2008) is created by interactions among and between taxpayers, tax officials, politicians, academics, as well as other tax and legal experts. Thus tax culture is created in much the same manner as North (1991) contends, institutions are created. This differs from Schumpeter's (1991) view of tax culture which assumes imposition by the state. In other words, a nation's tax culture is exclusively

dependent upon its tax policy, with tax payers merely responding to the incentives provided by the tax law. However, Schumpeter (1991) also contends that the ideal tax system is bounded by a nation's history, economics, and sociology.

Martinez-Vazquez and Wallace (2000) contend that a nation's tax system relies upon not only on the nation's tax culture but on its national culture and its institutions as well. National culture and institutions place limits on a nation's tax system. For example, some societies view certain activities as sacred, such as religious work or small farming and therefore those activities can only be lightly taxed.

Nerre (2008) contends that when it comes to tax systems, one size does not fit all. American style tax systems have had very little success in other parts of the world going back to the 1930's. Further, attempts to impose a tax system from one society to another have often led to disastrous results (Tanzi 1987). Tanzi (1987) cites the example of the Cuban government publically burning the tax law recommendations of the American tax delegation in 1931. American tax delegations were popular in the 1920's and 1930's and consisted of American tax experts advising other nation's governments on what a proper tax system ought to entail (Nerre 2008). Needless to say, they met with limited success (Tanzi 1987).

The importance of tax culture typically only becomes apparent when significant changes are contemplated or actually made to a country's tax system (Nerre 2008). Such changes can result in tax cultural shock if they are made dramatically or if they are not in accord with the national tax culture (Nerre 2008).

Tax culture is an often neglected aspect of the study of taxation and public finance. Only in Latin America is tax culture covered extensively and there the focus is

almost exclusively on taxpayer compliance (Cortázar-Velarde 2000). Taxpayer's noncompliance in Latin America is a serious problem for the region's governments. Latin American's are according to Tanzi (2000, 24) "allergic to income taxes." In a similar vein, Bird and Wallace (2003, 1) contend that taxpayers in the region "avoid the full impact of the tax laws." Likewise, Reid (2007) contends that in Latin America it is well known that the wealthy simply do not pay taxes.

Tsakumis, Curatola, and Porcano (2007) analyze tax policy differences among nations and find that Hofstede's (2001) cultural framework is correlated with tax evasion, after controlling for income. Richardson (2008) reaches a similar conclusion in a follow up study.

Campbell (2004) also contends that such a thing as 'tax culture' exists. Tax cultures, according to Campbell exist at the national level and progress in a path dependent manner. Campbell (2004) argues that the concept of bricolage applies to tax cultures. With cultural bricolage, new institutions take on the characteristics of the old institutions they replace. In a multi-decade analysis of the tax systems of OECD member countries, Campbell (2004) finds only modest convergence of tax cultures among nations in spite of increasing competitive pressures brought on by globalization. Campbell's finding makes sense in light of Nerre's (2008) contention that tax cultures exist at the national level and, therefore a universally 'objectively good' tax system cannot exist. Each nation must adopt its own unique solution to the problem of financing its government. Further, since social and economic conditions change over time, it only follows that tax systems must evolve over time as well. This illustrates Slemrod's and Bakija's (2004) observation that taxation is a perpetual struggle.

Optimal taxation adherents also contend that a country's tax policy should be reflective of its unique socioeconomic circumstances. Optimal Taxation Theory seeks to devise a system of taxation which maximizes the social welfare of society (Slemrod 1990). It asks the question: What tax or set of taxes will raise sufficient revenue for the government while leaving the taxpayers as well off as possible? It is an important question since different tax systems vary greatly in their aggregate cost to society. Since economies and societies differ in important respects, so too should tax systems. According to Sandmo (2005) the two main elements in any optimal tax theory model are the social welfare function of society and the revenue needs of the government. Other objectives of optimal tax theory include: minimizing the aggregate costs of taxation to society (Sandmo 2005), achieving production efficiency in the economy (Slemrod 1990), and uniformity (Sorensen 2007). Uniformity is important for simplicities sake which eases compliance and administrative burdens (Sorensen 2007), an important consideration for tax systems first observed by Adam Smith (2009).

The principles of optimal taxation theory apply to developing countries as well as to developed ones. Applying the theory to developing countries, however, introduces additional complications. Seemingly everything is more difficult in developing countries and tax policy is no different. Slemrod (1990) contends that administrative shortcomings are often the reason that optimal tax policies are not implemented. Slemrod (1990) also contends that empirical evidence indicates countries with low levels of literacy and presumably less administrative capability tend to rely on easier to collect but more economically distorting types of taxes. Corruption, which tends to be much more prevalent in developing countries, must also be taken into account in the design of a tax

system. According to Barreto and Alm (2003), the optimal tax mix in a corrupt economy includes relatively more consumption taxation and relatively less income taxation than would otherwise be the case. Optimal government size is also affected in such a society with a smaller government sector being preferred in corrupt societies (Barreto & Alm 2003). Although such tradeoffs exist for all countries, the stakes are much higher for developing nations. For example, it is generally held that in developing countries in dire need of investment capital, capital income should not be taxed, yet the result of such a tax policy would be highly regressive and inefficient from a social welfare perspective. That leaves developing countries with an unpleasant choice of either a highly regressive yet economically efficient tax system or else a less regressive but less economically efficient tax system.

An additional complication of optimal taxation in the developing world is the problem of tax evasion. Both Slemrod (1990) and Sandmo (2005) contend that an optimal tax system must take into account the effects of tax evasion. Estimated rates of tax evasion differ greatly across countries and seem to be especially prevalent in Latin America. Sandmo (2005) contends tax evasion is a social phenomenon and that a taxpayers' decision of whether or not to comply with the tax laws is dependent upon their perception of the behavior of others.

Behavioral economists including those who study optimal taxation look at the question from the opposite perspective. In other words why do people comply with tax laws and pay their taxes? According to Gueth and Sausgruber (2004) empirical evidence indicates taxpayers do not act in their own best interests. Most taxpayer face a small probability of being caught cheating on their taxes and if caught subject to a relatively

small penalty, yet the vast majority – at least in developed countries, comply with tax laws and pay their taxes provide some evidence of level of compliance. Hanlon, Mills, and Slemrod (2005) examine IRS audit results and find a corporate tax evasion rate of only 17.4 % in the United States in 2001. They also find individual income tax evasion of only 13.8 % in the same period. Likewise Schneider (2004) finds overall tax compliance rates of 86.04, 84.33, 82.27, 85.10, 87.43, and 88.97 percent in Australia, Canada, Denmark, France, New Zealand, and Japan respectively. Gueth and Sausgruber (2004) believe social motives and a sense of social duty motivates taxpayers. Sandmo (2005) concurs, contending taxpayers' conscience and the social stigma of being caught compel compliance. Taxpayers are also motivated by considerations of fairness with respect to the quality of governmental services received according to Sandmo (2005). In Latin America's case it could be that poor government leads to poor taxpayer compliance which leads to underfunded governments which in turn contributes to poor quality government services.

In summary this paper relies on the theory that culture matters (Harrison & Huntington 2000). More specifically, that culture manifests itself in economically important ways including preferences for the size of government and the willingness to submit to taxation in order to pay for government. This paper also relies on the idea that no universal culture exists which explains preferences for the size of government. Further, this paper relies on the idea that national cultures exist. The existence of national cultures is supported by the theoretical work of Anderson (2006) and the theoretical and empirical work of Hofstede (2001) and Inglehart and Welzel (2005).

Additionally, this paper relies on the idea that culture can be measured and quantified in meaningful ways.

Finally, this paper relies on the work of a number of other researchers who have theoretically or empirically addressed the determinants of government size or of national tax levels. The size of the governmental sector and the level of taxation vary considerably among nations, among those who have contributed to understanding that difference include: Tocqueville (1965); Meltzer and Richard (1981); Alesina and Spolaore (1997); Alesina and Waciarg (1998); Rodrik (1998); Mulligan and Sala-i-Martin (1999); Becker and Mulligan (2003); Persson and Tabellini (2004); Benarroch and Panday (2008); Bird, Martinez-Vazquez, and Togler (2008), and Aidtyand and Jensenz (2009).

CHAPTER III

DATA, VARIABLES, AND HYPOTHESES

The dependent variable used in this analysis, tax effort, is formally defined as the total amount of tax revenue collected from compulsory transfers from citizens to the government divided by Gross Domestic Product of the country. Information on tax effort is taken from the CIA World Factbook (CIA 2010). The CIA World Factbook compiles data from a number of sources. Information on tax effort is from the International Monetary Fund.

In a supplementary analysis, governmental expenditures are also used as the dependent variable. This is done in order to confirm the results obtained with tax effort as the dependent variable. Government expenditures represent the total current expenditures for all governments within a country. Information on governmental expenditures is taken from the CIA World Factbook (CIA 2010).

Primary Analysis

The main independent variables reflect cultural attributes at the national level. Data on the main independent variables are taken from Hofstede and Hofstede (2005). Hofstede's (2001) country scores are relative to the other countries in the set. Four of Hofstede's five cultural dimensions are claimed to be related to tax effort. Those cultural dimensions are: individualism and collectivism, masculinity and femininity, uncertainty avoidance, and power distance.

Individualism "pertains to societies in which the ties between individuals are loose … collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's

lifetimes continue to protect them in exchange for unquestioning loyalty" (Hofstede 2005, 76). Loyalty in collectivist societies is to the family, clan, or tribe and not to the nation, or society at large. Further, there are low levels of interpersonal trust between individuals in such societies (Fukuyama 2002). Banfield (1958) and Putnam (1993) count the Sicilian Mafia as an extreme example of a high collectivist society. High scores on individualism are predicted to be associated with high tax effort and government spending.

Masculinity and femininity relates to traditional gender roles within society. High scores on masculinity and femininity, as defined by Hofstede (2005) are associated with clear divisions between the sexes. Men are strong, assertive, and driven by achievement and material success. Women are modest, caring, and concerned with quality of life. Low scores occur when gender roles overlap. More traditional societies tend to have more clearly defined gender roles than do more modern ones. Low masculinity and femininity scores are predicted to be associated with high tax effort and government spending.

Power distance relates to the manner in which societies deal with human inequality. Inequality among individuals is explicit in the superior subordinate work relationship. Inequality among people can also be related to physical or mental characteristics, social standing, prestige, income, wealth, power, age, or occupation (Hofstede 2001). Societies in which power distance is great are termed elitist while those with little distance between social levels are considered pluralist. Power distance scores are independent of developmental status, according to Hofstede (2001). Power distance scores of countries are consistent over time as trend data indicates no evidence of

significant movement (Hofstede 2001). Countries with low scores on power distance are expected to be associated with high taxation and government spending.

Uncertainty avoidance relates to the coping mechanisms employed by a society to deal with the uncertainties of life. Rules and regulation, both formal and informal compensate for the anxiety associated with an unpredictable and uncertain future (Hofstede 2001). Societies have developed diverse strategies for dealing with uncertainty. It is hypothesized that some of those coping strategies are more conducive toward higher taxation and larger governments than others. Countries with high scores on uncertainty avoidance are expected to be associated with high tax effort and government spending.

Control variables include Gross National Income per capita, trade openness, population and whether or not a country is governed by a democratically elected Parliament. Gross National Income per capita is a measure of a country's income. It is scaled on a purchasing power parity basis for comparative purposes. Gross National Income per capita is obtained from the World Bank's World Development Indicators (World Bank 2010). The population of the country and its level of trade openness – defined as exports plus imports divided by GDP, are also control variables. Population data is from the CIA (2010) World Factbook while information on trade openness is from the World Bank's World Development Indicators (World Bank 2010). A Parliamentary dummy variable is also included since countries with Parliamentary type democracies tend to have materially larger governments. Greater spending in Parliamentary type governments is thought to be the result of their need to maintain coalitions and majorities in order to remain in office (Persson, Roland, & Tabellini 2000).

Data was collected for the years 1990, 1995, 2000, and 2006 representing the years in which the World Values Surveys were conducted. The surveys provide alternative cultural measures which allow for testing to confirm results observed using the Hofstede cultural measures. Accordingly, the Hofstede (2001) cultural dimensions are analyzed utilizing the same time periods. In other words, the dependent variable tax effort is regressed against Hofstede's cultural dimensions and control variables with data from the years 1990, 1995, 2000, and 2006.

Only discrete sovereign countries are included in this analysis, therefore groupings of countries and regions within countries which are included in Hofstede and Hofstede's (2005) analysis are excluded here. Countries involved in this analysis consist of the following: Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Czech Republic, Chile, China, Columbia, Croatia, Costa Rica, Denmark, Ecuador, El Salvador, Estonia, Finland, France, Germany, Greece, Guatemala, Hong Kong, Hungary, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Luxembourg, Malaysia, Malta, Mexico, Morocco, Netherlands, New Zealand, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Romania, Russia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Suriname, Sweden, Switzerland, Taiwan, Thailand, Trinidad, Turkey, United Kingdom, United States, Uruguay, Venezuela, and Vietnam.

National cultural dimension scores as measured by Hofstede and Hofstede (2005) are in Table 1 below. The scores are relative to one another, not absolute. As such they reflect differences in cultural values among countries. The scores are on a 0 to 100 scale based on the original IBM surveys. A few scores exceed 100; those scores are based on

subsequent surveys. A high number means that a country scores high in individualism, masculinity, power distance, or uncertainty avoidance.

Table 1

Hofstede and Hofstede's National Cultural Scores

Country	PD	IND	MASC	UA
Argentina	49	46	56	86
Australia	36	90	61	51
Austria	11	55	70	70
Bangladesh	80	20	55	60
Belgium	65	75	54	94
Brazil	69	38	49	76
Bulgaria	70	30	40	85
Canada	39	80	52	48
Czech Republic	57	58	57	74
Chile	63	23	28	86
China	80	20	66	30
Columbia	67	13	64	80
Croatia	73	33	40	80
Costa Rica	35	15	21	86
Denmark	18	74	16	23
Ecuador	78	8	63	67
El Salvador	66	19	40	94
Estonia	40	60	30	60
Finland	33	63	26	59
France	68	71	43	86
Germany	35	67	66	65
Greece	60	35	57	112
Guatemala	95	6	37	101
Hong Kong	68	25	57	29
Hungary	46	80	88	82
India	77	48	56	40
Indonesia	78	14	46	48
Iran	58	41	43	59
Ireland	28	70	68	35
Israel	13	54	47	81

Table 1 (continued).

Country	PD	IND	MASC	UA
Italy	50	76	70	75
Jamaica	45	39	68	13
Japan	54	46	95	92
Luxembourg	40	60	50	70
Malaysia	104	26	50	36
Malta	56	59	47	96
Mexico	81	30	69	82
Morocco	70	46	53	68
Netherlands	38	80	14	53
New Zealand	22	79	58	49
Norway	31	69	8	50
Pakistan	55	14	50	70
Panama	95	11	44	86
Peru	64	16	45	87
Philippines	94	32	64	44
Poland	68	60	64	93
Portugal	63	27	31	104
Romania	90	30	42	90
Russia	93	39	36	95
Serbia	86	25	43	92
Singapore	74	20	48	8
Slovakia	104	52	110	51
Slovenia	71	27	19	88
South Africa	49	65	63	49
South Korea	60	18	39	85
Spain	57	51	42	86
Suriname	85	47	37	92
Sweden	31	71	5	29
Switzerland	34	68	70	58
Taiwan	58	17	45	69
Thailand	64	20	34	64
Trinidad	47	16	58	55
Turkey	66	37	45	85
United Kingdom	35	89	66	35
United States	40	91	62	46
Uruguay	61	36	38	100

Table 1 (continued).

Country	PD	IND	MASC	UA
Venezuela	81	12	73	76
Vietnam	70	20	40	30

Note. PD is Power Distance; IND is Individualism and Collectivism; MASC is Masculinity and Femininity; UA is Uncertainty Avoidance. Source: Hofstede and Hofstede (2005).

Table 2 displays the descriptive statistics of the dependent and independent variables for the data used in the Hofstede analysis. Shown are the number of observations, minimum, maximum, mean, median, and standard deviation for each of the variables. Included in the data set are observations for 68 countries from the years 1990, 1995, 2000, and 2006.

Table 2

Descriptive Statistics of the Dependent and Independent Variables for the tests of Hofstede's Cultural Dimensions.

Variable	n	Minimum	Maximum	Mean	Median	Standard Deviation
Tax Effort	272	1.83	59.87	23.84	18.39	17.26
Government Expenditures	272	2.31	76.92	25.3	19.73	17.45
Individualism	272	6	91	43.41	39	23.85
Masculinity	272	5	110	49.87	49.5	18.75
Uncertainty Avoidance	272	8	112	67.62	70	23.08
Power Distance	272	11	104	59.43	61	21.75
GNI per capita	264	490	58,750	14,049	10,355	11,289

Table 2 (continued).

Variable	n	Minimum	Maximum	Mean	Median	Standard Deviation
Population	264	0.36	1,321.85	71.90	16.28	194.49
Trade Openness	259	3.98	438.09	71.52	56.72	60.52
Parliamentary dummy	272	0.00	1.00	0.65	1.00	0.48

Tax Effort and Government Expenditures are expressed as a percentage of GDP.

Population is reflected in the millions.

GNI per capita is reflected in U.S. dollars.

The objective of this paper is to test the hypothesis that certain characteristics of a nation's culture affect its tax effort. More specifically, to test the hypothesis that countries with higher individualism and collectivism have higher tax effort. A further objective is to test the hypothesis that countries with low masculinity and femininity scores have higher tax effort. Such a finding will be in support of theory, outlined in this paper. Another objective is to test the hypothesis that countries with high scores on uncertainty avoidance have higher tax effort. The final objective is to test the hypothesis that countries with low power distance scores have higher tax effort. Such findings will be in support of the theory outlined in this paper.

Hypotheses

The main hypotheses in the study are as follows:

Statement of Null and Research (Alternative) Hypotheses:

H_o**:** There is not a relationship between Individualism and Collectivism and tax effort.

H_1: There is a direct relationship between Individualism and Collectivism and tax effort.

H_2: There is not a relationship between Masculinity and Feminism and tax effort.

H_3: There is a direct relationship between Masculinity and Feminism and tax effort.

H_4: There is not a relationship between Power Distance and tax effort.

H_5: There is a direct relationship between Power Distance and tax effort.

H_6: There is not a relationship between Uncertainty Avoidance and tax effort.

H_7: There is a direct relationship between Uncertainty Avoidance and tax effort.

The basic econometric model which tests the relationship between Hofstede's (2001) cultural variables and the size of government is as follows:

$$Tax\ Effort = \beta_0 + \beta_1 IND_i + \beta_2 MASC_i + \beta_3 PD_i + \beta_4 UA_i + \beta_5 GNI_{it} + \beta_6 POP_{it} + \beta_7 Trade_{it} + \beta_8 ParDum_{it} + u$$

Where:

Tax Effort is the size of the government expressed as a percentage of gross domestic product.

IND is the Individualism and Collectivist country score.

MASC is the Masculinity and Femininity country score.

PD is the Power Distance country score.

UA is the Uncertainty Avoidance country score.

GNI is the Gross National Income per capita expressed on a Purchasing Power Parity basis.

POP is the nation's population in millions.

Trade is the Trade Openness (Exports plus Imports divided by GDP) of the country.

ParDum is the Parliamentary Dummy, One if the country is governed by a democratically elected Parliament, zero otherwise.

u represents unobserved factors which affect the size of government. u also includes the error term.

t = 1,2,3,4 corresponding to the years 1990, 1995, 2000, and 2006.

i is the individual country observation.

Supplemental Analysis

The supplemental analysis is conducted in order to confirm the results obtained from the original analysis. This analysis utilizes an alternative source, the World Values Survey (Inglehart 2010) for the national cultural attributes. The World Values Survey is conducted every five years or so by social science researchers from leading universities throughout the world. At least one thousand people are interviewed in each of the more than eighty countries surveyed. The surveys are designed to be representative samples and to reflect the basic values and beliefs of the societies surveyed. Five waves of surveys have been conducted to date beginning in 1981. The most recently conducted survey is the 2006 survey.

Researchers have identified two cultural dimensions which explain much of the variation in basic values and beliefs. Those two cultural dimensions are traditional versus secular rational values and survivalist versus self expression values. The traditional versus secular rational dimension reflects the importance of religion and traditional beliefs to society. Strongly traditional societies are deferential to authority, view religion as very important in their lives, have strong family ties with well defined roles, are nationalistic, and have limited tolerance for others. Societies which have high secular

rational values are less deferential to authority, view religion as less important, are less nationalistic, and have greater tolerance for others. El Salvador and Tanzania are examples of countries with strong traditional values while Japan and Sweden are examples of countries with strong secular rational values.

The survivalist versus self expression cultural dimension reflects the transition from industrial society to post-industrial or knowledge society. In industrial societies, the emphasis is on economic and physical security while in knowledge societies, the emphasis shifts to individual well being, self expression, and the quality of life. Countries with high self expression values place a strong emphasis on participation in political and economic decision making, gender equality, and individual freedoms and are generally tolerant of other cultures. Countries with strong self expressive values include Canada and the Netherlands. Countries with strong survivalist values include Russia and Romania (see Table 3).

As with the original analysis, the control variables consist of Gross National Income per capita, trade openness, population, and whether or not a country is governed by a democratically elected Parliament.

Gross National Income per capita is a measure of a country's income. It is scaled on a purchasing power parity basis for comparative purposes. Gross National Income per capita is obtained from the World Bank's World Development Indicators (World Bank 2010). The population of the country and its level of trade openness – defined as exports plus imports divided by GDP, are also control variables. Population data is from the CIA (2010) World Factbook while information on trade openness is from the World Bank's World Development Indicators (World Bank 2010). A Parliamentary dummy variable is

also included since countries with Parliamentary type democracies tend to have materially larger governments than do Presidential type democracies. Greater spending in Parliamentary type governments is thought to be the result of their need to maintain coalitions and majorities in order to remain in office (Persson, Roland, & Tabellini 2000).

As with the Hofstede (2001) analysis data was collected for the years 1990, 1995, 2000, and 2006. Countries included in the analysis of the World Values Survey (Inglehart 2010) cultural dimensions are as follows: Albania, Algeria, Andorra, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bosnia, Brazil, Britain, Bulgaria, Burkina Faso, Canada, Chile, China, Columbia, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Germany, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Georgia, Ghana, Greece, Guatemala, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Jordon, Kyrgyzstan, Latvia, Lithuania, Luxemburg, Macedonia, Malaysia, Mali, Malta, Mexico, Moldova, Montenegro, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russia, Rwanda, South Africa, South Korea, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, Uganda, Ukraine, Uruguay, United States, Venezuela, Vietnam, Zambia, and Zimbabwe. As with the Hofstede (2001) analysis, only discrete sovereign countries are included. Accordingly, certain sub-national regions included in the World Values Survey (Inglehart 2010) are excluded.

The listing of the national cultural value scores from the World Values Survey (Inglehart 2010) is in Table 3. Scores for both the traditional versus secular rational cultural dimension and the survivalist versus self expression cultural dimension range

from negative two to positive two. A negative score means that a society is more traditional than secular rational or else more survivalist than self expressionist; with a positive score the opposite is true.

Table 3

World Values Survey National Cultural Values

World Values Survey Nation-level mean scores on Traditional/Secular-rational and Survival/Self-expression values dimensions, 1981 – 2007

(wave 1=1981, wave 2=1990, wave 3= 1995, wave 4= 2000, wave 5= 2006)

Nation & Wave	Trad Rat Values	Self Surv Values	Nation & Wave	Trad Rat Values	Self Surv Values	Nation & Wave	Trad Rat Values	Self Surv Values
Albania 3	0.52	-1.56	Bulgaria 2	1.28	-1.33	Egypt 4	-1.69	-0.64
Albania 4	0.07	-1.14	Bulgaria 3	0.90	-1.23	Egypt 4	-1.61	-0.46
Algeria 4	-1.48	-0.74	Bulgaria 4	1.15	-1.52	El Salvador 4	-2.06	0.53
Andorra 5	0.80	1.62	Bulgaria 5	1.13	-1.01	Estonia 2	1.30	-0.88
Argentina 1	0.00	-0.30	BurkinaFas 5	-1.32	-0.49	Estonia 3	1.27	-1.30
Argentina 2	-0.46	0.03	Canada 1	-0.52	1.04	Estonia 4	1.27	-1.19
Argentina 3	-0.60	0.71	Canada 2	0.07	1.31	Ethiopia 5	-0.65	-0.36
Argentina 4	-0.95	0.36	Canada 4	-0.16	1.72	Finland 1	0.63	0.82
Argentina 5	-0.66	0.38	Canada 5	-0.26	1.91	Finland 2	1.21	1.26
Armenia 3	0.55	-1.31	Chile 2	-1.10	-0.20	Finland 3	0.68	1.01
Australia 1	-0.34	1.14	Chile 3	-0.81	-0.08	Finland 4	0.84	0.94
Australia 3	-0.18	1.96	Chile 4	-0.87	0.12	Finland 5	0.82	1.12
Australia 5	0.21	1.75	Chile 5	-0.87	0.00	France 1	0.54	0.13
Austria 2	0.23	0.80	China 2	1.79	-1.13	France 2	0.38	0.71
Austria 4	0.25	1.43	China 3	0.79	-1.23	France 4	0.52	0.94
Azerbaijan 3	-0.14	-1.38	China 4	1.20	-0.93	France 5	0.63	1.13
Bangladesh 3	-1.24	-1.10	China 5	0.80	-1.16	Galicia 3	-0.04	1.34
Bangladesh 4	-1.21	-0.93	Colombia 3	-1.71	0.34	Georgia 3	-0.04	-1.31
Belarus 2	0.93	-1.12	Colombia 4	-1.67	0.68	Ghana 3	-1.66	-0.05
Belarus 3	0.67	-1.72	Colombia 5	-1.87	0.60	Ghana 5	-1.94	-0.29
Belarus 4	0.89	-1.23	Croatia 3	0.72	-0.51	Greece 4	0.77	0.55
Belgium 1	0.09	0.08	Croatia 4	0.08	0.31	Guatemala 4	-1.70	-0.17

Table 3 (continued).

Nation & Wave	Trad Rat Values	Self Surv Values	Nation & Wave	Trad Rat Values	Self Surv Values	Nation & Wave	Trad Rat Values	Self Surv Values
Belgium 2	0.40	0.77	Cyprus 5	-0.56	0.13	Hong Kong 5	1.20	-0.98
Belgium 4	0.50	1.13	Czech 2	1.24	-0.11	Hungary 1	0.17	-1.07
Bosnia 3	0.09	-0.56	Czech 3	1.07	0.33	Hungary 2	0.46	-1.06
Bosnia 4	0.34	-0.65	Czech 4	1.23	0.38	Hungary 3	0.79	-0.77
Brazil 2	-0.95	-0.38	Denmark 1	1.60	1.44	Hungary 4	0.40	-1.22
Brazil 3	-1.29	0.02	Denmark 2	1.25	1.20	Iceland 1	0.01	0.83
Brazil 5	-0.98	0.61	Denmark 4	1.16	1.87	Iceland 2	0.27	1.12
Britain 1	-0.25	0.95	Dom Rep 3	-1.05	0.33	Iceland 4	0.44	1.63
Britain 2	0.08	1.13	E Germany 2	1.06	0.60	India 2	-0.49	-0.91
Britain 3	0.08	1.24	E Germany 3	1.74	0.58	India 3	-0.54	-0.69
Britain 4	0.29	1.31	E Germany 5	1.46	0.26	India 4	-0.52	-0.60
Britain 5	0.06	1.68	E. Germany 4	1.44	0.42	India 5	-0.36	-0.21
Indonesia 4	-1.07	-0.50	Moldova 5	0.47	-1.28	Russia 2	1.09	-1.34
Indonesia 5	-0.47	-0.80	Montenegro 3	0.58	-1.12	Russia 3	0.87	-1.85
Iran 3	-1.40	-0.34	Montenegro 4	0.86	-1.24	Russia 4	1.09	-1.88
Iran 4	-1.22	-0.45	Morocco 4	-1.64	-1.09	Russia 5	0.49	-1.42
Iraq 5	-0.40	-1.68	Morocco 5	-1.32	-1.04	Rwanda 5	-1.57	-0.62
Ireland 1	-0.92	0.59	Moscow 2	1.44	-0.79	S Africa 1	-0.53	-0.40
Ireland 2	-1.10	1.00	N. Ireland 1	-0.78	-0.06	S Africa 2	-0.92	-0.46
Ireland 4	-0.91	1.18	N. Ireland 4	-0.33	0.84	S Africa 3	-1.26	-0.46
Israel 4	0.26	0.36	N. Ireland 2	-0.86	0.80	S Africa 5	-1.09	-0.10
Italy 1	0.18	-0.60	Neth'lands 1	0.73	0.90	S Korea 1	1.08	-0.74
Italy 2	0.11	0.53	Neth'lands 2	0.77	1.99	S Korea 2	1.11	-0.65
Italy 4	0.19	0.85	Neth'lands 4	0.84	1.94	S Korea 3	0.96	-0.64
Italy 5	0.13	0.60	Neth'lands 5	0.71	1.39	S Korea 5	0.61	-1.37
Japan 1	1.41	-0.41	N. Zealand 3	0.20	1.78	S.Africa 4	-1.12	-0.10
Japan 2	1.62	-0.12	N. Zealand 5	0.00	1.86	S.Korea 4	1.13	-0.55
Japan 3	1.79	0.37	Nigeria 2	-1.62	-0.68	Saudi Arab. 4	-1.31	0.15
Japan 4	1.91	0.54	Nigeria 3	-1.58	-0.68	Serbia 3	0.84	-1.05
Japan 5	1.96	-0.05	Nigeria 4	-1.53	0.28	Serbia 4	0.65	-1.03
Jordan 3	-1.46	-0.97	Norway 1	0.89	0.53	Serbia 5	0.35	-0.62
Jordan 4	-1.61	-1.05	Norway 2	1.17	0.79	Singapore	-0.54	-0.28
Kyrgyz 4	-0.15	-0.91	Norway 3	1.31	1.33	Slovakia 2	.075	-0.82
Latvia 2	1.21	-0.60	Norway 5	1.39	2.17	Slovakia 3	0.41	-0.27
Latvia 3	1.33	-0.89	Pakistan 3	-1.39	-0.52	Slovakia 4	0.67	-0.43
Latvia 4	0.72	-1.27	Pakistan 4	-1.42	-1.25	Slovenia 2	0.64	-0.62
Lithuania 2	0.68	-0.64	Peru 3	-1.26	-0.18	Slovenia 3	0.69	-0.04

Table 3 (continued).

Nation & Wave	Trad Rat Values	Self Surv Values	Nation & Wave	Trad Rat Values	Self Surv Values	Nation & Wave	Trad Rat Values	Self Surv Values
Lithuania 3	0.96	-1.45	Peru 4	-1.36	0.03	Slovenia 4	0.95	0.38
Lithuania 4	0.98	-1.00	Philipines 3	-1.38	-0.12	Slovenia 5	0.73	0.36
Luxemburg 4	0.42	1.13	Phillipines 4	-1.21	-0.11	Spain 1	-0.26	-0.52
Macedonia 3	0.31	-1.02	Poland 2	-0.81	-0.27	Spain 2	-0.06	0.20
Macedonia 4	0.12	-0.72	Poland 3	-0.47	-0.41	Spain 3	-0.37	0.47
Malaysia 5	-0.73	0.09	Poland 4	-0.43	-0.60	Spain 4	0.12	0.51
Mali 5	-1.25	-0.08	Poland 5	-0.78	-0.14	Spain 5	0.09	0.54
Malta 4	-1.53	-0.03	Portugal 2	-0.21	-0.43	Sweden 1	1.20	0.85
Mexico 1	-1.15	-0.26	Portugal 4	-0.90	0.49	Sweden 2	1.17	1.54
Mexico 2	-0.30	0.09	Puerto Rico 3	-2.01	0.81	Sweden 3	1.49	1.99
Mexico 3	-0.81	0.30	Puerto Rico 4	-2.07	1.12	Sweden 4	1.67	2.09
Mexico 4	-1.47	0.53	Romania 2	0.24	-1.18	Sweden 5	1.86	2.35
Mexico 5	-1.47	1.03	Romania 3	0.36	-1.26	Switzerland 2	0.19	1.11
Moldova 3	0.36	-1.91	Romania 4	-0.28	-1.60	Switzerland 3	0.82	1.35
Moldova 4	0.46	-1.69	Romania 5	-0.39	-1.55	Switzerland 5	0.74	1.90
Taiwan 3	0.66	-0.81	USA 2	-0.68	1.35			
Taiwan 5	1.16	-1.18	USA 3	-0.89	1.62			
Tanzania 4	-1.84	-0.15	USA 4	-0.52	1.59			
Thailand 5	-0.64	0.01	USA 5	-0.81	1.76			
Trinidad 5	-1.83	-0.26	Venezuela 3	-1.82	0.35			
Turkey 2	-0.89	-0.17	Venezuela 4	-1.60	0.43			
Turkey 3	-1.13	0.28	Vietnam 4	-0.68	0.22			
Turkey 4	-0.86	-0.34	Vietnam 5	-0.30	-0.26			
Turkey 5	-0.89	-0.33	W Germany 1	0.83	-0.07			
Uganda 1	-1.42	-0.50	W Germany 2	1.23	0.69			
Ukraine 3	0.84	-1.83	W Germany 3	1.55	1.52			
Ukraine 4	0.90	-1.72	W Germany 5	1.31	0.74			
Ukraine 5	0.30	-0.83	W Germany 4	1.17	0.44			
Uruguay 3	-0.21	0.48	Zambia 5	-0.77	-0.62			
Uruguay 5	-0.37	0.99	Zimbabwe 4	-1.50	-1.36			

Source: Inglehart (2010)

Table 4 displays the descriptive statistics of the dependent and independent variables for the data used in the World Values Survey analysis. Shown are the number of observations, minimum, maximum, mean, median, and standard deviation for each of

the variables. Included in the data set are observations for 94 countries from the years 1990, 1995, 2000, and 2006.

Table 4

Descriptive Statistics of the Dependent and Independent Variables for the World Values Survey Analysis

Variable	n	Minimum	Maximum	Mean	Median	Standard Deviation
Tax Effort	191	1.21	76.38	21.71	15.15	17.55
Gov Expenditures	191	1.70	76.92	22.71	16.94	17.25
Traditional vs. Rational	251	-2.07	1.96	-0.02	0.09	1.01
Survival vs. Self Expression	251	-1.91	2.35	0.00	-0.08	0.99
GNI per capita	211	210	53,210	12,404	8,230	10,953
Population	205	7.18	1321.85	84.82	22.93	217.16
Trade Openness	201	2.01	250.60	40.58	32.05	34.00
Parliamentary dummy	251	0.00	1.00	0.49	0.00	0.50

Tax Effort and Government Expenditures are expressed as a percentage of GDP.

Population is reflected in the millions.

GNI per capita is reflected in U.S. dollars.

World Values Survey (Inglehart 2010) cultural dimensions are used in order to confirm the results observed from the tests of the Hofstede (2001) cultural variables. The objective of this portion of the paper is to test the hypothesis that certain characteristics of a nation's culture affect its tax effort and the size of the governmental sector. More specifically, to test the hypothesis that countries with high traditional versus secular rational scores have high tax effort and government spending. An additional objective is to test the hypothesis that countries with high survivalist versus self expression scores

have high tax effort and government spending. Such results will confirm the theory outlined in this paper.

Hypotheses related to the World Values Survey are as follows:

H_8: There is not a relationship between Traditional versus Secular Rational values and tax effort.

H_9: There is a direct relationship between Traditional versus Secular Rational values and tax effort.

H_{10}: There is not a relationship between Survivalist versus Self Expression values and tax effort.

H_{11}: There is a direct relationship between Survivalist versus Self Expression values and tax effort.

The basic econometric model which tests the relationship between World Values Survey (2010) cultural variables and the size of government is as follows:

$$Tax\ Effort = \beta_0 + \beta_1 TradRat_{it} + \beta_2 SurvSelf_{it} + \beta_3 GNI_{it} + \beta_4 POP_{it} + \beta_5 Trade_{it} + \beta_6 ParDum_{it} + u$$

Where:

Tax Effort is the size of the government as a percentage of gross domestic product.

TradRat is the Traditional versus Secular Rational country score.

SurvSelf is the Survivalist versus Self Expression country score.

GNI is the Gross National Income per capita expressed on a Purchasing Power Parity basis.

POP is the nation's population in millions.

Trade is the Trade Openness (Exports plus Imports divided by GDP) of the country.

ParDum is the Parliamentary Dummy, One if the country is governed by a democratically elected Parliament, zero otherwise.

u represents unobserved factors which affect the size of government. u also includes the error term.

t = 1,2,3,4 corresponding to the years 1990, 1995, 2000, and 2006.

i is the individual country observation.

A number of hypotheses related to the control variables used in the analysis are also tested. Those hypotheses related to the other independent and control variables are as follows:

H_{12}**:** There is not a relationship between Gross National Income per capita and tax effort.

H_{13}**:** There is a direct relationship between Gross National Income per capita and tax effort.

H_{14}**:** There is not a relationship between Population and tax effort.

H_{15}**:** There is a direct relationship between Population and tax effort.

H_{16}**:** There is not a relationship between Trade Openness and tax effort.

H_{17}**:** There is a direct relationship between Trade Openness and tax effort.

H_{18}**:** There is not a relationship between being governed by a Parliamentary Democracy and tax effort.

H_{19}**:** There is a direct relationship between being governed by a Parliamentary Democracy and tax effort.

Results of the hypotheses testing will be displayed and discussed in Chapter IV.

CHAPTER IV

STATISTICAL METHODS AND RESULTS OF THE ANALYSIS

Pooled least squares regression is utilized to empirically test the main hypotheses of the study. Pooled least squares regression is appropriate whenever independently sampled cross sections are obtained from large populations at different points in time (Wooldridge 2006). Since the World Values Survey (2010) is conducted in such a manner, pooled least squares is appropriate. World Values Surveys' (2010) were conducted in the years 1990, 1995, 2000, and 2006. The surveys provide alternative cultural measures which allow for testing to confirm results observed using the Hofstede cultural measures. Accordingly, the Hofstede (2001) cultural dimensions are analyzed utilizing the same methodology - pooled least squares covering the same time periods. In other words, the dependent variable tax effort is regressed against Hofstede's cultural dimensions and control variables with data from the years 1990, 1995, 2000, and 2006.

The first World Values Survey conducted in 1981 is excluded from this analysis for two reasons. First, the survey covered only 24 countries and secondly there is a lack of data availability for all countries with respect to the dependent variable as well as the other control variables for 1981.

Note, the independent variables GNI per capita and population have been transformed in order to avoid the use of scientific notation in the results tables. GNI per capita has been divided by 100 while population has been reflected in the millions.

Pooled Regression Tax Effort Regressed on the Hofstede Variables

The model achieved an F score of 33.53 with a p-value of 0.0000. Overall the independent and control variables explain about fifty nine and a half (59.5) percent of the

variation in the level of tax effort with the adjusted R squared equal to 0.5946. Table 5 shows the coefficients, standard error, t value, and corresponding p-values for each of the independent variables. As the results indicate there are strong associations between the various independent variables and the dependent variable, tax effort. The result is consistent with and supports the theories as outlined in the paper.

The basic econometric model which tests the relationship between Hofstede's (2001) cultural variables and the size of government is as follows:

$$Tax\ Effort = \beta_0 + \beta_1 IND_i + \beta_2 MASC_i + \beta_3 PD_i + \beta_4 UA_i + \beta_5 GNI_{it} + \beta_6 POP_{it} + \beta_7 Trade_{it} + \beta_8 ParDum_{it} + u$$

Where:

Tax Effort is the size of the government as a percentage of gross domestic product.

IND is the Individualism and Collectivist country score.

MASC is the Masculinity and Femininity country score.

PD is the Power Distance country score.

UA is the Uncertainty Avoidance country score.

GNI is the Gross National Income per capita expressed on a Purchasing Power Parity basis.

POP is the nation's population in millions.

Trade is the Trade Openness (Exports plus Imports divided by GDP) of the country.

ParDum is the Parliamentary Dummy, one if the country is governed by a democratically elected Parliament, zero otherwise.

u represents unobserved factors which affect tax effort. *u* also includes the error term.

t = 1,2,3,4 corresponding to the years 1990, 1995, 2000, and 2006.

i is the individual country observation.

Results from the primary analysis are reflected in Table 5 below:

Table 5

Pooled Regression Tax Effort on Hofstede Cultural Variables

Variable	Coef.	Std. Err.	T	p-values	
IND	0.001163	0.000469	2.48	0.014	**
MASC	-0.00186	0.000395	-4.71	0.000	*
PD	-0.00042	0.000487	-0.87	0.385	
UA	.0000969	0.000376	0.26	0.797	
GNIpercap	.0007256	.0001089	6.67	0.000	*
PopMil	-0.00015	5.27E-05	-2.91	0.004	*
TrOpen	-0.00027	0.000153	-1.78	0.077	***
Parliament	0.063629	0.01702	3.74	0.000	*
1995	-0.08385	0.020785	-4.03	0.000	*
2000	-0.12611	0.021125	-5.97	0.000	*
2006	-0.05443	0.023239	-2.34	0.020	**
Intercept	0.254546	0.04951	5.14	0.000	*
F score	33.53				
Adj. R^2	0.5946				
N = 245					

*Statistically Significant at the 0.01 level.
** Statistically Significant at the 0.05 level.
*** Statistically Significant at the 0.10 level.

The dummy variables designated 1995, 2000, and 2006 are included in order to allow the intercept to differ among time periods included in the pooled cross section. The first year of the analysis, 1990, serves as the base year while subsequent years are assigned a dummy variable corresponding to the year of the survey. Allowing the intercept to differ among time periods reflects the fact that the population surveyed may have different distributions in different years (Wooldridge 2006).

The regression is rerun and the coefficients calculated in order to gauge the relative magnitude of the effect of each of the independent variables on the dependent

variable. Beta coefficients are obtained in order to determine the relative contribution of the individual independent and control variables. Although statistical significance is important, it does not reflect the whole story. According to Zilack and McClosky (2007, 2) blind adherence to statistical significance without regard to the magnitude of the effect represents "mathematical statistics gone terribly wrong."

Results from the Beta coefficients of the Hofstede cultural variables are reflected in Table 6 below:

Table 6

Beta Coefficients of Tax Effort on Hofstede Cultural Variables

	Beta	Rank
IND	0.1621422	6
MASC	-0.2012843	4
PD	-0.0530845	10
UA	0.0126235	11
GNIpercap	0.4717299	1
PopMil	-0.1359927	8
TrOpen	-0.0942896	9
Parliament	0.1751273	5
1995	-0.2058739	3
2000	-0.3146831	2
2006	-0.137193	7

As Table 6 indicates, among the variables of interest, masculinity, and femininity has the largest affect. Only the control variable gross national income per capita has a larger affect on tax effort than does the masculinity and femininity variable. Individualism and collectivism also has a large affect; it has the next largest affect on the

dependent variable. Accordingly, the results of the analysis are not only statistically significant but meaningful as well.

Table 7 is a table of signs. It reflects both the predicted sign as well as the observed sign after running the regression. As the table indicates, all of the variables of interest are observed to have the predicted sign as well as three of the four control variables. Trade openness is the sole exception; it was predicted to have a positive effect on the dependent variable but was found to have a negative effect.

Table 7

Direction of Affects of the Independent and Control Variables on the Dependent Variable for the Hofstede analysis

Variable	Predicted Sign	Observed Sign
Individualism and Collectivism	+	+
Masculinity and Femininity	-	-
Uncertainty Avoidance	+	+
Power Distance	-	-
GNI per capita	+	+
Population	-	-
Trade Openness	+	-
Parliamentary Democracy	+	+

All of the independent variables of interest are observed to have the predicted sign. In other words, the direction of the affect is consistent with the hypotheses. Further, three of the four control variables have the predicted sign as well, trade openness being the sole exception. The same results hold true when governmental expenditures are used as the dependent variable in place of tax effort: all of the variables of interest have

the predicted sign and all but trade openness among the control variables have the predicted sign. Signs of statistically insignificant coefficients are however, meaningless.

Pooled Regression Governmental Expenditures Regressed on the Hofstede Variables

The model achieves an F score of 29.28 with a p-value of 0.0000. Overall the independent and control variables explain about fifty six (56) percent of the variation in the level of tax effort with the adjusted R squared equal to 0.5604. Table 8 shows the coefficients, standard error, t value, and corresponding p-value for each of the independent variables. As the results indicate there are strong associations between the various independent variables and the dependent variable, tax effort. The result is consistent with and supports the theories as outlined in the paper.

Results from the analysis are reflected in Table 8 below:

Table 8

Pooled Regression Governmental Expenditures Regressed on the Hofstede Cultural Variables

Variable	Coef.	Std. Err.	t	p values	
IND	0.001578	0.000493	3.2	0.002	*
MASC	-0.00157	0.000415	-3.8	0.000	*
PD	-0.00052	0.000511	-1.03	0.306	
UA	0.000719	0.000395	1.82	0.070	***
GNIpercap	6.22E-06	1.14E-06	5.44	0.000	*
PopMil	-0.00013	5.54E-05	-2.26	0.025	**
TrOpen	-0.00017	0.000161	-1.03	0.303	
Parliament	0.066532	0.017888	3.72	0.000	*
1995	-0.08169	0.021845	-3.74	0.000	*
2000	-0.15242	0.022202	-6.87	0.000	*
2006	-0.0847	0.024425	-3.47	0.001	*

Table 8 (continued).

Variable	Coef.	Std. Err.	t	p values	
Intercept	0.217007	0.052036	4.17	0.000	*
F score	29.28				
Adj. R^2	0.5604				
N = 245					

*Statistically Significant at the 0.01 level.
** Statistically Significant at the 0.05 level.
*** Statistically Significant at the 0.10 level.

Table 9

Beta Coefficients Governmental Expenditures Regressed on Hofstede Cultural Variables

	Beta	Rank
IND	0.2178715	3
MASC	-0.1688803	7
PD	-0.0650687	10
UA	0.0928475	9
GNIpercap	0.400613	1
PopMil	-0.1100848	8
TrOpen	-0.0569492	11
Parliament	0.1814294	6
1995	-0.1987126	5
2000	-0.3768285	2
2006	-0.2115197	4

As Table 9 indicates, among the variables of interest, individualism and collectivism has the largest affect on the dependent variable. Only the control variable gross national income per capita has a larger affect on governmental expenditures than does the individualism and collectivism variable. The parliamentary democracy variable and the masculinity and femininity variable also have large affects on the dependent

variable. Accordingly, the results of the analysis are not only statistically significant but meaningful as well.

Pooled Regression Tax Effort Regressed on the World Values Survey Variables

The model achieved an F score of 35.91 with a p-value of 0.0000. Overall the independent and control variables explain nearly sixty three (63) percent of the variation in the level of tax effort with the adjusted R squared equal to 0.6281. Table 10 shows the coefficients, standard error, t value, and corresponding p-value for each of the independent variables. As the results indicate there are strong associations between the various independent variables and the dependent variable, tax effort. The result is consistent with and supports the theories as outlined in the paper.

The basic econometric model which tests the relationship between World Values Survey (2010) cultural variables and the size of government is as follows:

$$Tax\ Effort = \beta_0 + \beta_1 TradRat_{it} + \beta_2 SurvSelf_{it} + \beta_3 GNI_{it} + \beta_4 POP_{it} + \beta_5 Trade_{it} + \beta_6 ParDum_{it} + u$$

Where:

Tax Effort is the size of the government as a percentage of gross domestic product.

TradRat is the Traditional versus Secular Rational country score.

SurvSelf is the Survivalist versus Self Expression country score.

GNI is the Gross National Income per capita expressed on a Purchasing Power Parity basis.

POP is the nation's population in millions.

Trade is the Trade Openness (Exports plus Imports divided by GDP) of the country.

ParDum is the Parliamentary Dummy, one if the country is governed by a democratically elected Parliament, zero otherwise.

u represents unobserved factors which affect tax effort. *u* also includes the error term.

t = 1,2,3,4 corresponding to the years 1990, 1995, 2000, and 2006.

i is the individual country observation.

Results from the analysis are reflected in Table 10 below:

Table 10

Pooled Regression Tax Effort Regressed on the World Values Survey Cultural Variables

Variable	Coef.	Std. Err.	T	p values	
TradRational	0.029695	0.011239	2.64	0.009	*
SurvSelf	0.035416	0.013102	2.7	0.008	*
PopMill	-0.00015	4.76E-05	-3.12	0.002	*
Parliament	0.061349	0.020952	2.93	0.004	*
GNIpercap	5.91E-06	1.39E-06	4.25	0.000	*
TrOpen	-0.00028	0.000197	-1.44	0.152	
1995	-0.09	0.025786	-3.49	0.001	*
2000	-0.10508	0.024414	-4.3	0.000	*
2006	-0.05045	0.02724	-1.85	0.066	***
Intercept	0.204251	0.028264	7.23	0.000	
F score	35.91				
Adj. R^2	0.6281				
N = 187					

*Statistically Significant at the 0.01 level.
**Statistically Significant at the 0.05 level.
***Statistically Significant at the 0.10 level.

Table 11

Beta Coefficients Tax Effort Regressed on the World Values Survey Variables

	Beta	Rank
TradRational	0.1706334	5
SurvSelf	0.2007036	4
PopMill	-0.1469154	7
Parliament	0.1700956	6
GNIpercap	0.374761	1
TrOpen	-0.0745561	9
1995	-0.2073203	3
2000	-0.284728	2
2006	-0.1257962	8

As Table 11 indicates, among the variables of interest, survivalist versus self expression values has the largest affect on tax effort. Only the control variable gross national income per capita has a larger affect. The traditional versus secular rational values variable and the parliamentary democracy variable also have large affects on the dependent variable. Accordingly, the results of the analysis are not only statistically significant but meaningful as well.

Table 12 is a table of signs. It reflects both the predicted sign as well as the observed sign after running the regression with the World Values Survey cultural value variables. As the table indicates, all of the variables of interest are observed to have the predicted sign as well as three of the four control variables. Trade openness is the sole exception; it was predicted to have a positive effect on the dependent variable but was found to have a negative effect.

Table 12

Direction of Affects of the Independent and Control Variables on the Dependent Variable for the World Values Survey Analysis

Variable	Predicted Sign	Observed Sign
Traditional versus Secular Rational	+	+
Survivalist versus Self Expressive	+	+
GNI per capita	+	+
Population	-	-
Trade Openness	+	-
Parliamentary Democracy	+	+

As with the Hofstede (2001) table of signs shown above, all of the independent variables of interest in the World Values Survey analysis are observed to have the predicted sign. In other words, the direction of the affect is consistent with the hypotheses. Further, three of the four control variables also have the predicted sign as well with trade openness being the sole exception. The same results hold true when governmental expenditures are used as the dependent variable in place of tax effort: all of the variables of interest have the predicted sign and all but trade openness among the control variables have the predicted sign. Signs of statistically insignificant coefficients are however, meaningless.

Pooled Regression Governmental Expenditures Regressed on the

World Values Survey Cultural Variables

The model achieved an F score of 35.50 with a p-value of 0.0000. Overall the independent and control variables explain about sixty two and a half (62.5) percent of the variation in the level of governmental expenditures with the adjusted R squared equal to

0.6254. Table 13 shows the coefficients, standard error, t value, and corresponding p-value of the independent variables. As the results indicate there are strong associations between the various independent variables and the dependent variable, governmental expenditures. The result is consistent with and supports the theories as outlined in the paper.

Results from the analysis are reflected in Table 13 below:

Table 13

Pooled Regression Governmental Expenditures Regressed on the World Values Survey Cultural Variables

Variable	Coefficient	Std. Err.	T	p values	
TradRational	0.0293168	0.01108	2.65	0.009	*
SurvSelf	0.034791	0.012917	2.69	0.008	*
PopMill	-0.0001379	4.69E-05	-2.94	0.004	*
Parliament	0.0711295	0.020655	3.44	0.001	*
GNIpercap	5.35E-06	1.37E-06	3.90	0.000	*
TrOpen	-0.0003082	0.000194	-1.59	0.114	
1995	-0.0868598	0.02542	-3.42	0.001	*
2000	-0.1223351	0.024068	-5.08	0.000	*
2006	-0.0762018	0.026854	-2.84	0.005	*
Intercept	0.229337	0.027864	8.23	0.000	*
F score	35.50				
Adj. R^2	0.6254				
N = 187					

*Statistically Significant at the .01 level.
** Statistically Significant at the .05 level.
*** Statistically Significant at the .10 level.

Table 14

Beta Coefficients Governmental Expenditures Regressed on the World Values Survey Cultural Variables

	Beta	Rank
TradRational	0.1715217	7
SurvSelf	0.2007432	5
PopMill	-0.1389565	8
Parliament	0.2007925	4
GNIpercap	0.3451889	1
TrOpen	-0.0825763	9
1995	-0.2037158	3
2000	-0.3374883	2
2006	-0.1934398	6

As Table 14 indicates, among the variables of interest, survivalist versus self expression values has the largest affect on governmental expenditures. Only the control variable gross national income per capita has a larger affect. The traditional versus secular rational values variable and the parliamentary democracy variable also have large affects on the dependent variable. Accordingly, the results of the analysis are not only statistically significant but meaningful as well.

Supplemental Testing

Pooled least squares regression and hypothesis testing are dependent upon a number of assumptions; accordingly, compliance with those assumptions is tested. Included are tests for the non-normality of residuals. Additional tests are performed to test for outliers, influential points, and leverage. Tests for heteroskedasticity of residuals, multi-collinearity, and the linearity assumption are also conducted.

Normality Testing

The first series of tests are conducted in order to test for normality of residuals. Normality of residuals is not a requirement of regression, it is however a requirement of valid hypothesis testing. If normality of residuals is lacking then the p values for the t and F tests are not valid (Chen *et al.* 2003).

$H_{0:}$ The residuals are normally distributed.

$H_{1:}$ The residuals are not normally distributed.

Three graphical tests of normality are conducted. After the regression is run the residuals are predicted. Then the three graphs are analyzed. The first compared Normal density with the Kernel density estimate. The second and third graphs are the qnorm and pnorm graphs. The qnorm is sensitive to non-normality near the tails and the pnorm is sensitive to non-normality in the middle. All three graphs show some evidence of non-normality of residuals.

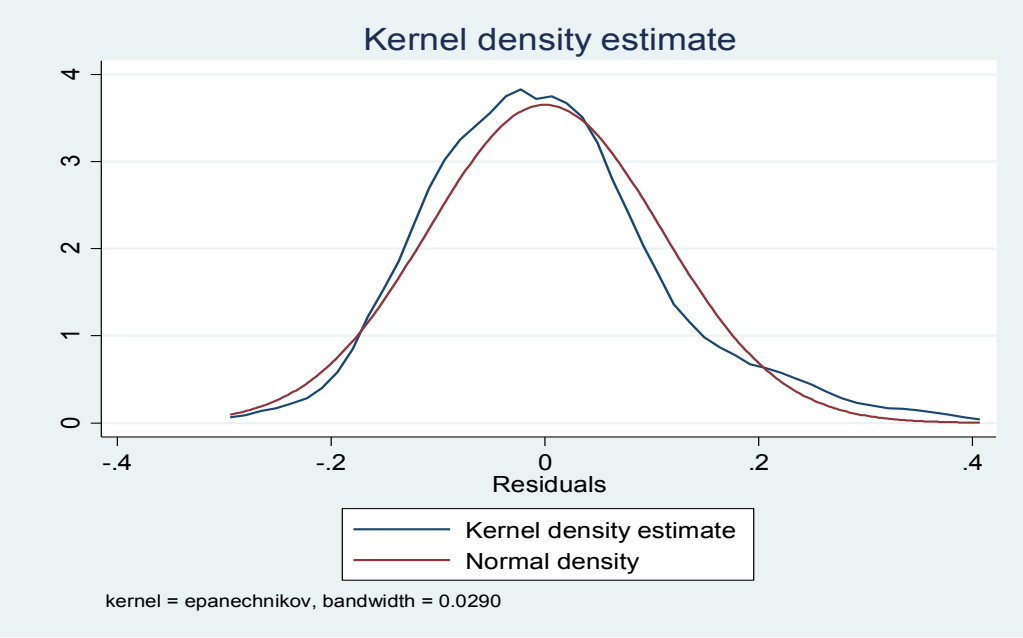

Figure 1. Comparison of Normal Density with the Kernal Density Estimate

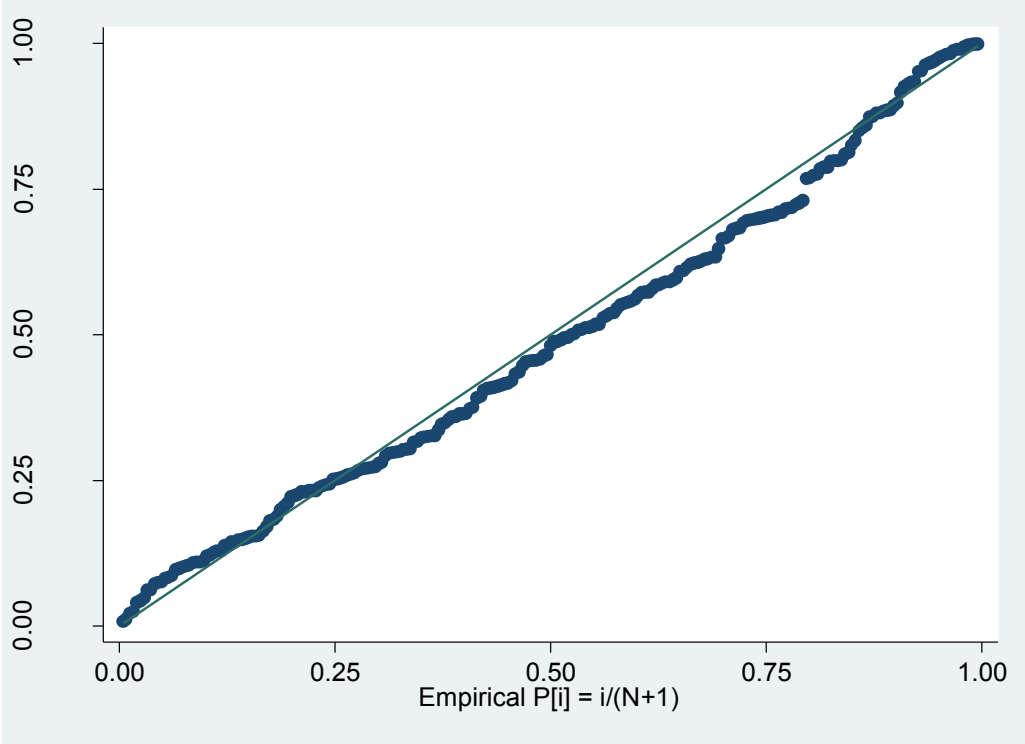

Figure 2. Pnorm Graph

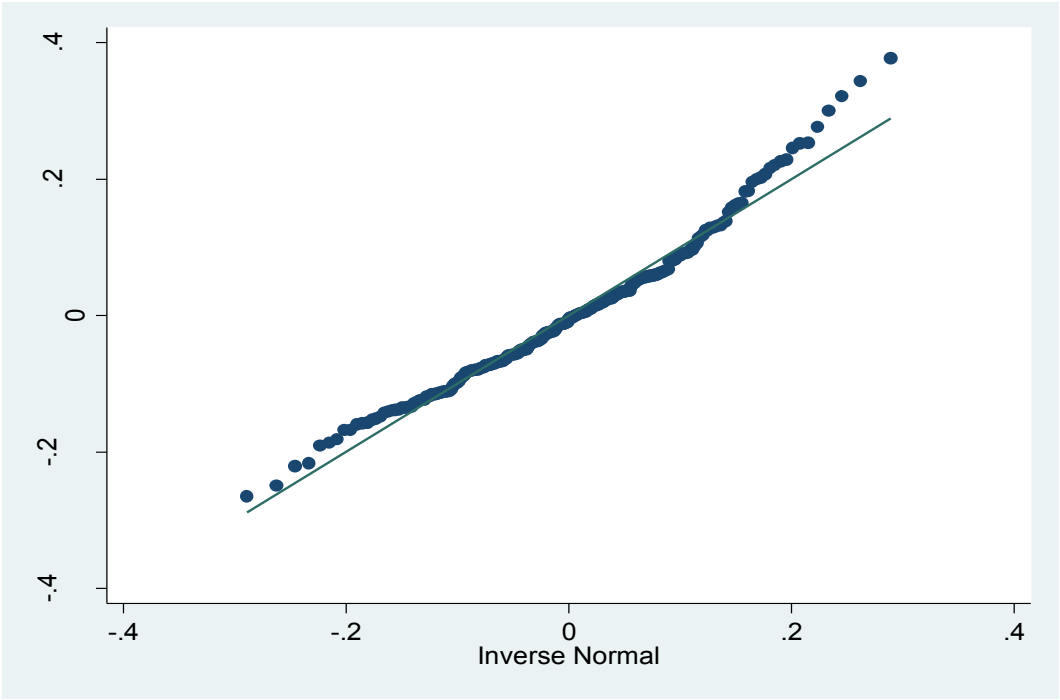

Figure 3. Qnorm Graph

Next the Shaprio-Wilk W test for normality is performed. The p value of the test is based on the assumption that that the distribution is normal. Given the results of the test, a z value of 3.356 and a p value of 0.00040, the assumption that the distribution is normal must be rejected. The S-Francia or Shapiro-Francia test also yields similar results as does the skewness and kurtosis test for normality or sktest.

Based on the results of the Shaprio-Wilk W test, the S-Francia test and the sktest, as well as the inspection of the three graphs, the Null hypothesis that the residuals are normally distributed must be rejected.

Tests for Outliers, Influential Points, and Leverage

The next series of tests performed on the data are tests for outliers, influential points, and leverage. Outliers are observations with large residuals. They can have a large impact on the results of a regression.

$H_{0:}$ There are outliers which have too large an influence on the regression.

$H_{1:}$ There are no outliers which have too large an influence on the regression.

A visual inspection of a graph matrix was performed. The scatter graph showed the relationship between the dependent variable and each of the ten independent variables. Some outliers are observed, indicating a potential problem.

Next the Studentized Residual is calculated. This step is followed by a stem and leaf display of the results. Several of the observations are of concern since they exceeded the absolute value of two (Chen *et al.* 2003). Indeed, three observations are less than negative two and eleven are greater than two. Additionally, three observations are greater than three. Observations greater than the absolute value of three are of particular concern according to Chen *et al.* (2003) The most extreme observation is 3.52 rounded.

-2**	53,50
-2**	
-2**	02
-1**	98
-1**	75,70,68
-1**	55,54,46,45,44,41,40
-1**	37,37,29,28,27,27,23,23,23,22,20
-1**	16,14,14,14,09,08,06,05,05,04,03,02,02,01,01
-0**	97,94,91,90,89,84,82,81
-0**	76,76,75,74,73,73,73,73,72,70,69,69,67,66,66,65,65,65,64,62, ... (25)
-0**	59,58,54,53,53,53,53,51,51,51,48,47,46,45,45,45,44,42,40
-0**	39,37,36,36,35,34,34,32,32,27,27,24,23,23,23,22,22,21,21,20
-0**	18,16,13,12,12,11,11,11,09,08,05,03,03,02,01,01
0**	00,00,02,02,03,04,04,04,05,07,08,09,09,11,13,13,14,14,15,17,18,18,18
0**	20,21,22,22,23,23,24,25,27,28,29,31,31,31,32,33,33,34,34,38
0**	42,43,44,47,47,48,50,51,51,52,52,53,53,54,54,55,55,57,57,58,59,59
0**	60,61,73,73,74,75,78,79
0**	81,83,83,83,84,87,92,94,97
1**	05,06,09,15,15,17,18
1**	20,20,20,26,27,39
1**	45,48,52
1**	67,71,77,78
1**	86,87,91
2**	00,01,09,11
2**	28,34
2**	43,54
2**	79
2**	
3**	01,19
3**	
3**	52

Figure 4. Stem and Leaf Display of Studentized Residuals. Potential outliers are shaded in gray.

To determine the extent to which the outliers influence the regression, those observations considered to be outliers are omitted and the regression rerun. Omitting the outliers has little effect on the outcome. When the three most extreme observations are omitted, those with residuals greater than three, the F score increases from 33.53 to

36.47, both with p-values of 0.0000. The adjusted R^2 increases from .5946 to .6181. Further, all of the variables which are statistically significant before the outliers are omitted are statistically significant afterword and at the same levels of significance.

Likewise when the 11 outliers with an absolute value greater than 2 are omitted, there is little effect on the regression. The F score increases further to 38.53 with the p-value remaining at 0.0000. The adjusted R^2 also increases further to 0.6392. Finally, all of the variables which are statistically significant before the outliers are omitted are statistically significant afterword and at the same levels of significance with the exception of trade openness which becomes statistically significant at the .05 level with the omission of the outliers, rather than at the .10 level with the outliers included in the regression. Changes in coefficients are displayed in Table 15.

Table 15

Coefficient Comparison

	No Exclusions	Outliers Excluded	Influential Points Excluded
PD	-0.0004237	-0.0000338	0.0001464
IND	0.0011632	0.0012251	0.0009268
MASC	-0.0018595	-0.0012879	-0.001047
UA	0.0000969	0.0000813	0.0000127
1995	-0.0838549	-0.078752	-0.0729733
2000	-0.1261119	-0.1132437	-0.1116504
2006	-0.0544287	-0.0447221	-0.0535657
GNIpercap	0.0007256	0.0007373	0.0008425
PopMil	-0.0001532	-0.0001485	-0.0001586
TrOpen	-0.0002724	-0.0002813	-0.0002285
Parliament	0.0636291	0.052724	0.0518097
Intercept	0.2545455	0.1862173	0.1647928

A test of leverage is then conducted looking for observations which have too great an influence. Influential points are those observations which, if removed, would substantially change the estimated coefficients. The test of leverage utilizes the following cutoff formula for problems:

$$\frac{2k+2}{n}$$

where k is the number of predictor variables and n is the number of observations (Chen *et al.* 2003).

In this analysis the calculation is (2*11 + 2)/245 which equals .097960. A total of twelve observations have calculated leverage which exceeds the cutoff point. Accordingly, the test of leverage also yields potential problems with the data.

Next, leverage is plotted against the residual squared and the graph inspected. This is a test for both outliers and influential points. A number of observations are of concern.

Finally, overall measures of influence are conducted, specifically Cook's D and DFITS. Using the conventional cutoff of 4/n (Chen *et al.* 2003) or in our case 4/245 = .016327, Cook's D results in 16 observations above the cutoff point. Likewise DFITS whose cutoff is the absolute value of $2\sqrt{(\frac{k}{n})}$ or in this case $2\sqrt{(\frac{11}{245})}$ which equals 0.42378, yields 18 observations above the cutoff point.

To determine the extent to which the influential points affect the regression, those observations identified by DFITS are omitted and the regression rerun. Omitting the influential points has little effect on the regression. When the 18 influential points are omitted, the F score increases from 33.53 to 40.41 and the p-value remains 0.0000.

Likewise the adjusted R^2 increases from .5946 to .6573. Further, all but one of the variables which are statistically significant before the outliers are omitted, are statistically significant afterword and at the same levels of significance. The exception is trade openness which is statistically significant at the .10 level when all observations are included in the regression and not statistically significant when the influential points are omitted. Changes in coefficients are displayed in Table 15 above.

Based on the tests conducted, the Null hypothesis that there are outliers which have too large an influence on the regression is not rejected.

Tests of Homoskedasticity of Residuals

The next three tests are conducted to test the homoskedasticity of residuals. One of the assumptions of regression is that the error variance or the error term has the same variance at any value of the independent variable (Wooldridge 2006).

$H_{0:}$ The variance of the residuals is heteroskedastic.

$H_{1:}$ The variance of the residuals is homoskedastic.

The first method is the graphical method where the residuals are graphed against the fitted values. The reference line is set at $y = 0$. In other words, there should be no pattern in the residuals if the variances are homoskedastic. Visual inspection of the graph yields an apparent violation of the homoskedasticity assumption.

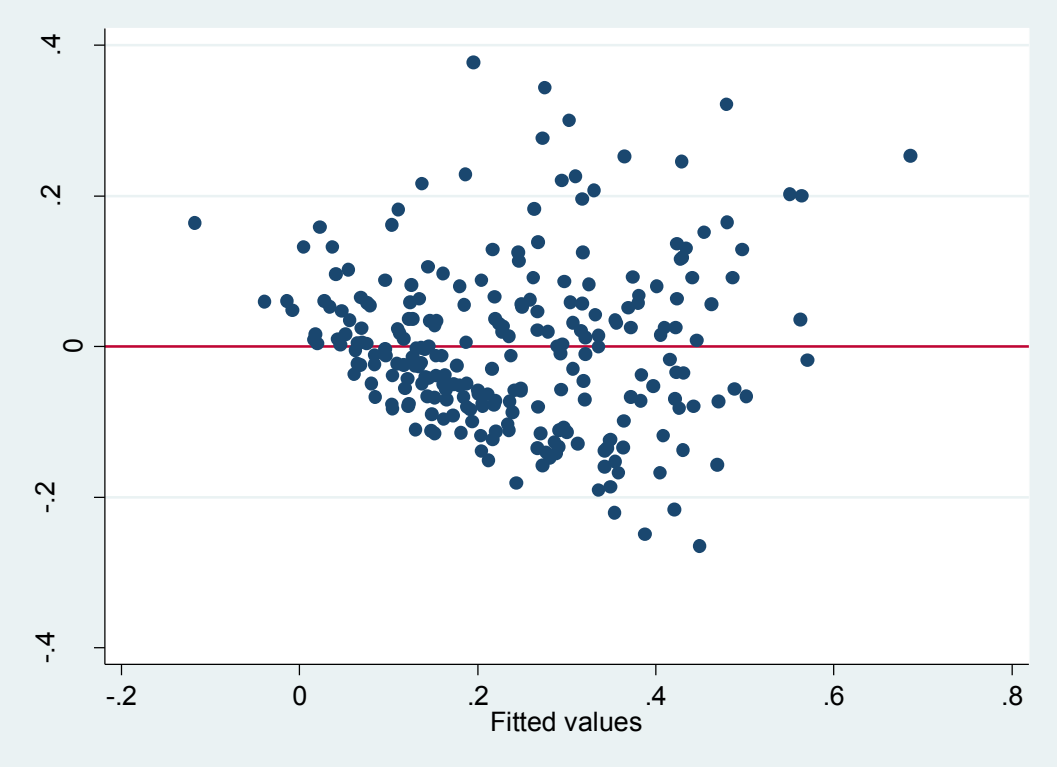

Figure 5. Residuals versus Fitted (Predicted) Values

Next, two mathematical tests of heteroskedasticity are conducted. Both test the null hypothesis that the variance of the residuals is homoskedastic. The Breusch-Pagan/Cook-Weisberg test of heteroskedasticity yields a chi^2 value of 25.22 and a p value of 0.0000, indicating a violation of the homoskedasticity assumption. Yielding a contrary result is the Cameron & Trivedi's decomposition of IM-test. For heteroskedasticity, the test yields a chi^2 value of 84.84 and a p value of 0.1093. The p value is only slightly higher than necessary to result in a confirmed violation of the homoskedastic assumption.

Based on the apparent violation of the homoskedasticity assumption from the visual inspection of the graph as well as the failure of the Breusch-Pagan/Cook-Weisberg test and the near failure of the Cameron & Trivedi's decomposition of IM-test, the Null hypothesis that the error variance is heteroskedastic is not rejected.

Tests for Multi-Collinearity

Next the variance inflation factor or VIF is calculated in order to test for multi-collinearity. When multi-collinearity of the independent variables exists; the coefficients are unstable and the standard errors for the coefficients are inflated (Chen *et al.* 2003).

$H_{0:}$ Multi-collinearity among predictor variables exists.

$H_{1:}$ Multi-collinearity among predictor variables does not exist.

VIF values greater than 10 are problematic as are Tolerances, defined as 1/VIF less than 0.1. Results of the tests indicated no multi-collinearity problem as all VIF's and Tolerances are well within the acceptable range. Indeed, the highest total VIF is only 3.07 and the mean VIF 1.83. Accordingly, the Null hypothesis is rejected. In other words no multi-collinearity problem exists.

Tests of the Linearity Assumption

Next a test of the linearity assumption is conducted by plotting the standardized residuals against each of the 11 predictor variables. In any linear regression it is assumed that the relationship between each of the independent variables and the dependent variable is linear.

$H_{0:}$ The relationship between each of the independent variables and the dependent variable is not linear.

$H_{1:}$ The relationship between each of the independent variables and the dependent variable is linear.

Visual inspection of the 11 graphs yields no clear pattern of nonlinearity. Accordingly the Null hypothesis is rejected and the alternative hypothesis accepted. In other words, there is no problem with the linearity assumption.

In the aggregate the tests of the data described above indicate that there are some minor problems with the data. However, data sets with problems are frequent occurrences and methods have been developed to overcome such problems. According to researchers at UCLA (Chen *et al.* 2003) the use of Huber-White sandwich estimators can adequately compensate for such minor errors in the data as lack of normality, heteroskedasticity, outliers, leverage, and influential points. Accordingly the data is utilized as is but the regression is performed using the robust option for estimating standard errors. No outliers are omitted since they do not have a substantial effect on the regression.

The tests of normality of residuals; outliers, influential points, and leverage; heteroskedasticity; multi-collinearity, and of the linearity assumption are all conducted on the Hofstede data. Similar results are obtained when the World Values Survey data is tested.

Table 16

Robust Pooled Regression with Tax Effort Regressed on the Hofstede Cultural Variables

Variable	Coef.	Robust Std. Error	T	p values	
PD	-0.000424	0.0005311	-0.80	0.426	
IND	0.0011632	0.0004663	2.49	0.013	**
MASC	-0.00186	0.000425	-4.38	0.000	*
UA	0.0000969	0.0003897	0.25	0.804	
1995	-0.083855	0.0216037	-3.88	0.000	*
2000	-0.126112	0.0205253	-6.14	0.000	*
2006	-0.054429	0.0236616	-2.30	0.022	**
PopMil	-0.000153	0.0000494	-3.10	0.002	*
Parliament	0.0636291	0.0167622	3.80	0.000	*
TrOpen	-0.000272	0.0001828	-1.49	0.137	

Table 16 (continued).

Variable	Coef.	Robust Std. Error	T	p values	
GNIpercap2	0.0007256	0.0001328	5.47	0.000	*
Intercept	0.2545455	0.0541304	4.70	0.000	*
F score	33.84				
R^2	0.6129				
N = 245					

*Statistically Significant at the 0.01 level.
** Statistically Significant at the 0.05 level.
*** Statistically Significant at the 0.10 level.

Table 17

Robust Pooled Regression with Government Expenditures Regressed on the Hofstede Cultural Variables

Variable	Coef.	Robust Std. Error	T	p values	
PD	-0.000524	0.0005755	-0.91	0.363	
IND	0.0015776	0.0005345	2.95	0.003	*
MASC	-0.001575	0.0004322	-3.64	0.000	*
UA	0.000719	0.0004053	1.77	0.077	***
1995	-0.081691	0.0243652	-3.35	0.001	*
2000	-0.152423	0.0215814	-7.06	0.000	*
2006	-0.084697	0.0247401	-3.42	0.001	*
PopMil	-0.000125	0.0000484	-2.59	0.010	*
Parliament	0.0665324	0.0177659	3.74	0.000	*
TrOpen	-0.000166	0.000178	-0.93	0.352	
GNIpercap2	0.000622	0.0001211	5.14	0.000	*
Intercept	0.217007	0.0564577	3.84	0.000	*
F score	35.88				
R^2	0.5802				
N = 245					

*Statistically Significant at the 0.01 level.
** Statistically Significant at the 0.05 level.
*** Statistically Significant at the 0.10 level.

Table 18

Robust Pooled Regression with Tax Effort Regressed on the World Values Survey Cultural Variables

Variable	Coef.	Robust Std. Error	T	p values	
TradRational	0.0296945	0.0122269	2.43	0.016	**
SurvSelf	0.0354157	0.0139419	2.54	0.012	**
PopMill	-0.000148	0.000033	-4.49	0.000	*
Parliament	0.0613493	0.0174983	3.51	0.001	*
TrOpen	-0.000283	0.0002031	-1.39	0.165	
GNIpercap2	0.0005912	0.0001649	3.58	0.000	*
1995	-0.090002	0.0304645	-2.95	0.004	*
2000	-0.105084	0.0284412	-3.69	0.000	*
2006	-0.050455	0.0285475	-1.77	0.079	
Intercept	0.2042512	0.0314703	6.49	0.000	*
F score	28.06				
R^2	0.6461				
N = 187					

*Statistically Significant at the 0.01 level.
** Statistically Significant at the 0.05 level.
*** Statistically Significant at the 0.10 level.

Table 19

Robust Pooled Regression with Government Expenditures Regressed on the World Values Survey Cultural Variables.

Variable	Coef.	Robust Std. Error	T	p values	
TradRational	0.0293168	0.0120794	2.43	0.016	**
SurvSelf	0.034791	0.013222	2.63	0.009	*
PopMill	-0.000138	0.0000321	-4.29	0.000	*
Parliament	0.0711295	0.0176436	4.03	0.000	*
TrOpen	-0.000308	0.0001854	-1.66	0.098	***
GNIpercap2	0.0005348	0.000134	3.99	0.000	*

Table 19 (continued).

Variable	Coef.	Robust Std. Error	T	p values	
1995	-0.08686	0.030639	-2.83	0.005	*
2000	-0.122335	0.0272471	-4.49	0.000	*
2006	-0.076202	0.028149	-2.71	0.007	*
Intercept	0.229337	0.0305507	7.51	0.000	*
F score	36.63				
R^2	0.6435				
N = 187					

*Statistically Significant at the 0.01 level.
** Statistically Significant at the 0.05 level.
*** Statistically Significant at the 0.10 level.

Evaluation of the Null and Alternative or Research Hypotheses

H_o**:** There is not a relationship between Individualism and Collectivism and tax effort.

H_1**:** There is a direct relationship between Individualism and Collectivism and tax effort.

Pooled least squares regression finds a statistically significant relationship between the individualism and collectivism cultural variable and tax effort. As Table 16 indicates the correlation is significant at the 0.05 level. Further, the relationship is meaningful as evidenced by the Beta coefficients found in Table 6 and has the correct sign as indicated by Table 7. Additionally, all of the results are confirmed when governmental expenditures are substituted for tax effort as the dependent variable. Indeed, as Table 17 indicates the correlation is statistically significant at the 0.01 level.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the alternative or research Hypotheses accepted.

H_2**:** There is not a relationship between Masculinity and Femininity and tax effort.

H_3**:** There is a direct relationship between Masculinity and Femininity and tax effort.

Pooled least squares regression finds a statistically significant relationship between the masculinity and femininity cultural variable and tax effort. As Table 16 indicates the correlation is significant at the 0.01 level. Further, the relationship is meaningful as evidenced by the Beta coefficients found in Table 6 and has the correct sign as indicated by Table 7. Additionally, all of the results are confirmed when governmental expenditures are substituted for tax effort as the dependent variable.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the alternative or research Hypotheses accepted.

H_4**:** There is not a relationship between Power Distance and tax effort.

H_5**:** There is a direct relationship between Power Distance and tax effort.

Pooled least squares regression finds no statistically significant relationship between the power distance cultural variable and tax effort. As Table 16 indicates the correlation is not significant at any level. Further, the relationship is not very meaningful as evidenced by the Beta coefficients found in Table 6, although the variable does have

the correct sign as indicated by Table 7. Additionally, all of the results are confirmed when governmental expenditures are substituted for tax effort as the dependent variable.

Considering the lack of statistical significance as well as the lack of meaningfulness of the results, the Null Hypotheses is not rejected.

H_6**:** There is not a relationship between Uncertainty Avoidance and tax effort.

H_7**:** There is a direct relationship between Uncertainty Avoidance and tax effort.

Pooled least squares regression finds no statistically significant relationship between the uncertainty avoidance cultural variable and tax effort. As Table 16 indicates the correlation is not significant at any level. Further, the relationship is not very meaningful as evidenced by the Beta coefficients found in Table 6, although the variable does have the correct sign as indicated by Table 7. As Table 17 indicates, when governmental expenditures are substituted for tax effort as the dependent variable, the results are significantly significant at the .10 level. However, the result is still not very meaningful as evidenced by the Beta coefficients found in Table 6.

Considering the lack of statistical significance as well as the lack of meaningfulness of the results, the Null Hypotheses is not rejected.

H_8**:** There is not a relationship between Traditional versus Secular Rational values and tax effort.

H_9**:** There is a direct relationship between Traditional versus Secular Rational values and tax effort.

Pooled least squares regression finds a statistically significant relationship between the traditional versus secular rational cultural variable and tax effort. As Table 18 indicates the correlation is significant at the 0.05 level. Further, the relationship is

meaningful as evidenced by the Beta coefficients found in Table 11 and has the correct sign as indicated by Table 12. Additionally, all of the results are confirmed when governmental expenditures are substituted for tax effort as the dependent variable.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the alternative or research Hypotheses accepted.

H_{10}**:** There is not a relationship between Survivalist versus Self Expression values and tax effort.

H_{11}**:** There is a direct relationship between Survivalist versus Self Expression values and tax effort.

Pooled least squares regression finds a statistically significant relationship between the survivalist versus self expression cultural variable and tax effort. As Table 18 indicates the correlation is significant at the 0.05 level. Further, the relationship is meaningful as evidenced by the Beta coefficients found in Table 11 and has the correct sign as indicated by Table 12. Additionally, all of the results are confirmed when governmental expenditures are substituted for tax effort as the dependent variable.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the alternative or research Hypotheses accepted.

H_{12}**:** There is not a relationship between Gross National Income per capita and tax effort.

H_{13}**:** There is a direct relationship between Gross National Income per capita and tax effort.

Pooled least squares regression finds a statistically significant relationship between gross national income per capita and tax effort. As Table 16 indicates the correlation is significant at the 0.01 level. Further, the relationship is meaningful as evidenced by the Beta coefficients found in Table 6. Indeed gross national income per capita has the largest effect of all the independent variable on the dependent variable. Further, the variable has the correct sign as indicated by Table 7. All of the results are confirmed when governmental expenditures are used as the dependent variable as indicated by Tables 17 and 19. All of the results are further confirmed when World Values Survey independent variables are used.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the alternative or research Hypotheses accepted.

H_{14}**:** There is not a relationship between Population and tax effort.

H_{15}**:** There is a direct relationship between Population and tax effort.

Pooled least squares regression finds a statistically significant relationship between population and tax effort. As Table 16 indicates the correlation is significant at the 0.01 level. Further, the relationship is meaningful as evidenced by the Beta coefficients found in Table 6. Additionally, the variable has the correct sign as indicated by Table 7. All of the results are confirmed when governmental expenditures are used as the dependent variable as indicated by Tables 17 and 19. All of the results are further confirmed when World Values Survey independent variables are used.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the research Hypotheses accepted.

H_{16}**:** There is not a relationship between Trade Openness and tax effort.

H_{17}**:** There is a direct relationship between Trade Openness and tax effort.

Pooled least squares regression finds no statistically significant relationship between trade openness and tax effort. As Tables 16, 17, and 18 indicate the correlation is not significant at any level. Only Table 19 indicates statistical significance at the 0.10 level. Further, the relationship is not very meaningful as evidenced by the Beta coefficients found in Tables 6 and 11 and the variable has the wrong sign as indicated by Table 7. When governmental expenditures are substituted for tax effort as the dependent variable the relationship is not very meaningful as evidenced by Tables 9 and 14 and the sign remains incorrect.

Considering the lack of statistical significance as well as the lack of meaningfulness of the results and the wrong signs, the Null Hypotheses is not rejected.

H_{18}**:** There is not a relationship between being governed by a Parliamentary Democracy and tax effort.

H_{19}**:** There is a direct relationship between being governed by a Parliamentary Democracy and tax effort.

Pooled least squares regression finds a statistically significant relationship between the parliament independent variable and tax effort. As Table 16 indicates the correlation is significant at the 0.01 level. Further, the relationship is meaningful as evidenced by the Beta coefficients found in Table 6. Indeed the parliament variable has the third largest effect of all the independent variable on the dependent variable and the variable has the correct sign as indicated by Table 7. All of the results are confirmed when governmental expenditures are used as the dependent variable as indicated by

Tables 17 and 19. All of the results are further confirmed when World Values Survey independent variables are used.

Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the research Hypotheses accepted.

Summary of Findings

The statistical analysis confirms the theory outlined in the paper that certain national culture attributes affect tax effort. The Hofstede (2001) cultural attributes individualism and collectivism and masculinity and femininity both are statistically significant and meaningful when regressed on tax effort. Likewise the World Values Survey's (2010) cultural attributes of traditional versus secular rational and survivalist versus self expression are also both statistically significant and meaningful when regressed on tax effort.

Additionally three out of four control variables are statistically significant when regressed on tax effort. Population, gross national income per capita, and the existence of a parliament are all statistically significant while trade openness is not. Likewise, the Hofstede (2001) cultural dimensions of power distance and uncertainty avoidance lack statistical significance.

The results are robust to changes in the measure of national culture utilized as evidenced by the comparable results from the Hofstede (2001) variables and the World Value Survey (2010) variables. The results are also robust to changes in the dependent variable when governmental expenditure is substituted for tax effort. Finally, the results are also robust to the inclusion or exclusion of outliers and influential points.

CHAPTER V

CONCLUSION

As the results of the statistical analysis clearly indicate, cultural factors do indeed play a role in determining a country's level of tax effort and the size of its government. In other words, the cultural differences observed among countries provide a partial explanation for the differences in aggregate tax levels and the size of governments. Certain cultural attributes or dimensions, specifically Hofstede's (2001) individualism and collectivism and masculinity and femininity as well as the World Values Survey's (2010) traditional versus secular rational and survivalist versus self expression cultural values, all have a statistically significant and meaningful affect on tax effort. As predicted by the theory outlined in the paper, countries with high individualism and collectivism scores have high tax effort and countries with low masculinity and femininity scores also have high tax effort. Likewise countries with high scores on the traditional versus secular rational cultural dimension have high tax effort and countries with high levels on the survivalist versus self expression cultural value also have high tax effort.

Contributions of This Research

This research contributes to the understanding of the differences among countries in tax effort and the related size of the governmental sector. It adds to the list of factors or determinants which affect tax effort and the size of government. This research explains about sixty (60) percent of the variation observed in tax effort among countries, after controlling for other known or theorized determinants.

Limitations of this Research

There are a number of limitations and weaknesses to various aspects of this analysis. There are limitations and weaknesses with respect to the data utilized in this analysis. Tax effort, for example can be and is calculated in a number of different ways. The same is true with government spending. Missing or incomplete data is a significant problem whenever differences among countries are analyzed; this is especially true of countries in the developing world. Although the survey data used to calculate the national cultural scores may be complete, information on the control variables such as GDP or trade openness may be estimates. Even in the highly developed United States there are limitations with respect to population counts. Likewise, even a well understood and widely used measure of national income like GDP or GNI suffers from a number of limitations. Again, this is especially true of developing nations where often a majority of economic activities are part of the transaction economy.

There are limitations with respect to Hofstede's (2001) cultural dimensions. Baskerville (2003) objects to Hofstede's equating of culture with nation as well as his use of numerical indices in an attempt to quantify and explain something as complex as culture. Further Baskerville (2003) questions the ability of anyone outside of a culture from understanding the culture. In other words, it takes a Frenchman to understand French culture.

Like Baskerville (2003), McSweeney (2003) objects to Hofstede's cultural dimensions on multiple grounds. He questions the existence of national culture and doubts that something as elusive as culture can be operationalized. McSweeney (2003) also questions the ability of a survey of the employees of one corporation being able to

capture the information required to measure cultures of nations. It represents no more than a narrow survey, according to McSweeney (2003), certainly not a national survey. McSweeney (2003) also questions the ability of an outsider to gain a complete understanding of another culture.

Hofstede (2001) appears to be aware of the limitations of his cultural dimensions. Hofstede (2001) acknowledges, describes, and replies to many such critiques. Hofstede (2001) addresses the critique that nations are not the best units of measurement for studying culture. Most nations of the world are not monolithic single culture entities; rather they are a complex mixture of overlapping multiple sub-cultures. However nations exist and, according to Hofstede (2001) and others, they differ greatly in their underlying cultures. Hofstede (2001) argues that a national culture is common to most members of a nation, even those from markedly differing subcultures. Hofstede goes on to argue that while nations may not be the optimal unit of measure, they are a useful measure. Nations are particularly useful for cross country comparisons.

The next methodological critique Hofstede (2001) discusses is what can be termed the generalization issue. It is not reasonable, critics argue, to generalize from a survey of the employees of only one multinational firm to an entire nation. In other words the IBM employees surveyed do not represent an accurate sample of the entire nations from which they originate. IBM is a unique organization even among multinational firms and it undertakes great effort to foster an IBM culture among its worldwide employees. Hofstede (2001) counters that what he is measuring are differences in cultural attributes. Granted IBM employees are not representative of the nations from which they originate, however, IBM employees at all levels and from all

departments of the organization are surveyed, everyone from grounds-keeping to corporate executives are included in the surveys. While the IBM employees surveyed may not constitute a representative sample of the nations from which they originate, those employees retain certain national cultural attributes and it is those attributes which Hofstede (2001) contends are being measured. The only difference among the groups of employees from the various countries surveyed is nationality; in all other material respects the employees are similar. Accordingly, the scores on Hofstede's (2001) cultural dimensions should be an accurate reflection of the differences in national cultural attributes.

The final critique Hofstede (2001) addresses is the age of the surveys. The IBM employee surveys began in the late 1960's and many critics question the continuing validity of such old data. Hofstede (2001) counters that argument by stating that survey work continues and, further that national cultural attributes are remarkably stable over time. Indeed, Hofstede (2001) maintains that many cultural distinctions among European nations can be traced back to the Roman Empire. Further, there have been numerous subsequent surveys by other researchers which have replicated the IBM results. In major replication studies, Hoppe (1990), Shane (1995), Merritt (2000), Sondergaard (2002), van Nimegen (2002), and de Mooij (2004) all confirm Hofstede's (2001) findings. Additionally, many researchers in many different fields continue to use the cultural dimensions and find them to be correlated with many economic and social phenomena.

In the final analysis, the quality of a measure of a societal cultural attribute is dependent upon its usefulness. Is the measure statistically correlated with important social, political, and economic phenomena? Are those correlations meaningful and does

the measure provide explanatory and predictive power? If the answers to the above questions are yes, then it is reasonable to assume that the measures of cultural attributes are valid. The use of Hofstede's (2001) cultural dimension measures by other researchers provides direct though limited support for their usage in this analysis.

The use of World Values Survey (2010) in the supplementary analysis mitigates many of the limitations of the Hofstede (2001) data. This is especially true with respect to criticisms regarding the narrowness of Hofstede's study as well as limitations with respect to the age of the surveys.

Perhaps the most significant limitation of this research is the danger that rather than national cultural attributes affecting tax effort, it could be some other unknown factor which affects both national cultural attributes and tax effort. As with most research in the social sciences, there are a large number of determinates which affect the dependent variable, many of them unknown and perhaps even unknowable.

Areas of Further Study and Research

A number of areas of further research are suggested by this study. Both the contributions of this research and the limitations of this research provide suggestions for further study.

The first area of further research would be to continue the search for determinants of tax effort. Although this study adds to the understanding of the differences in tax effort among nations, some two fifths of the difference remains unexplained.

Another area of research could attempt to find correlations with respect to national cultural attributes and the type of tax system a nation employs. Tax systems can take on many different forms, utilizing different types of taxes as well as varying degrees

of progressivity with respect to those taxes. Do certain national cultural attributes, for example, lead to a greater reliance on income taxation or alternatively, consumption taxation? Likewise, a further area of research could be an attempt to find correlations with respect to national cultural attributes and the progressivity of the tax system. In other words, do certain national cultural attributes lead to a more or less progressive tax system?

Another area of study could be to analyze the effects of national cultural attributes and their effect on the various components of government spending. Does culture affect governmental education spending, for example? Or social welfare spending and transfer payments? Or defense spending or spending on basic research and development? In other words, is there any correlation with national cultural attributes and the major categories of government spending?

Another area of future research could be looking at changes to the tax system of a country over time and attempting to correlate those changes with national cultural changes over the same time period. Such a time series analysis would require a long time frame as national cultural attributes appear to change very slowly.

A final area of potential future research is that of optimal taxation. Optimal taxation theory seeks to devise a system of taxation which maximizes the social welfare of society (Slemrod 1990). It asks the question: What tax or system of taxes will raise sufficient revenue for the government while leaving the society and its taxpayers as well off as possible? Optimal taxation addresses an important question since different tax systems vary greatly in their aggregate cost to society. Optimal taxation proponents contend that a country's tax policy should be reflective of its unique socioeconomic

circumstances. Since economies and societies differ in important respects, so too should their tax systems. In other words no two tax systems should be alike since no two societies are alike. Likewise the optimal tax system of a society will change as socioeconomic conditions change within the country. Finding a society's optimal tax effort and optimal tax system is perhaps the highest goal of tax policy research.

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